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Environmental Assessment

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Skutumpah Terrace Sagebrush Steppe Enhancement Project

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Location: Kane County, Utah

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1 PURPOSE AND NEED

1.1 Introduction

The Bureau of Land Management (BLM), Grand Staircase-Escalante National Monument (GSENM) and Kanab Field Office (KFO) has prepared an Environmental Assessment (EA) to analyze vegetation condition and impacts from vegetation treatments relative to the Skutumpah Terrace Sagebrush Steppe Enhancement Project (the Project). While the entire Project area is currently managed under the GSENM management plan of February 2000, some of the Project area would no longer reside in GSENM due to Proclamation 9682 of Dec. 4, 2017. These excluded lands would be managed by the KFO. A management plan for these excluded lands is currently being developed. Therefore, the Proposed Action and Alternatives conform to the GSENM management plan of February 2000.

The EA is a site-specific analysis of potential impacts that could result with the implementation of a Proposed Action or alternatives to the Proposed Action. The EA assists the BLM in Project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any "significant" impacts could result from the analyzed actions. "Significance" is defined by NEPA and is found in regulation 40 Code of Federal Regulations (CFR) 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of "Finding of No Significant Impact" (FONSI). A Decision Record (DR), which includes a FONSI statement, is a document that briefly presents the reasons why implementation of the selected action will not result in "significant" environmental impacts (effects) beyond those already addressed in the BLM's Grand Staircase-Escalante National Monument Record of Decision and Approved Monument Management Plan (BLM 2000) and Presidential Proclamations 6920 of September 8, 1996 and 9682 of December 4, 2017. If the decision maker determines that this Project has "significant" impacts following the EA analysis, then an EIS would be prepared for the Project. If not, a DR may be signed for the EA approving the alternative selected.

1.2 Location and Background

The Project area encompasses portions of the Kanab Creek Headwaters and Upper Johnson Wash sub-watersheds within the greater Kanab Creek watershed. The Project area contains BLM lands (54,018 acres) and private lands (1,029 acres) for a total of 55,047 acres located approximately 20 miles northeast of the community of Kanab within Kane County, Utah (see Figure A1, Appendix A, Project Location Map). Travel routes into the area include the Johnson Canyon, Glendale Bench and Skutumpah roads. Approximately 55% of the Project area (30,523 acres) will be analyzed for vegetative treatment. Vegetative cover is predominantly pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus utahensis*) (collectively referred to as "pinyon-juniper") and sagebrush (*Artemisia* spp.) with isolated pockets of oak (*Quercus* spp.), manzanita (*Arctostaphylos* spp.) and ponderosa pine (*Pinus ponderosa*). Native grasses and forbs are present in areas with low tree and sagebrush densities.

1.2.1 General Background

Sagebrush is the most widespread vegetation type in the intermountain lowlands of the western United States. However, sagebrush is one of the most imperiled ecosystems in North America due to a variety of factors. Very little surviving sagebrush is undisturbed, with 50 to 60% having altered understories or having been lost to direct conversions from catastrophic wildfire, farming, urban development, and conifer encroachment (U.S. Fish and Wildlife Service. 2013, Knick et al. 2003, and references therein). Since the 1850s, sagebrush steppe communities, which dominated the Intermountain West, have shifted to woodlands

or invasive annual-dominated communities (Tausch et al. 1981, Miller and Wigand 1994). Pinyon-juniper woodlands have increased substantially in both density and extent throughout the Intermountain West over the past 130 to 150 years, often invading landscapes previously dominated by sagebrush (Tausch et al. 1981, Miller and Wigand 1994). The Project area is no exception to this invasion. Pinyon-juniper occurrence within the Project area is over 200% higher than expected and 51,187 acres (93%) of the Project area is 'significantly altered' from natural expected vegetative conditions (see Chapter 2 Description of Alternatives and section 3.3.5 Fuels and Fire Management).

In pre-European settlement times, periodic wildfires within the Project area maintained a healthy balance of vegetation types and prevented woody fuels from accumulating to hazardous levels. Coarse-scale data suggest that 98% of the Project area is within a fire regime 1 or 2 that had a fire return interval of 0-35 years prior to European settlement. That is not to say that all acres within that area were burned or fully consumed. Some areas experienced stand-replacing fire on less than 75% of the area while other areas had stand replacing fire on more than 75% of the area. After settlement, but before grazing became regulated with the passage of the Taylor Grazing Act in 1934, the area was likely overgrazed by cattle and other forms of domestic livestock. Overgrazing in the sagebrush steppe reduced fine fuels needed to carry these periodic fires and consequently contributed to pinyon-juniper expansion and infilling. Fire suppression in recent history has also contributed to the current non-natural conditions. Only three fires over 25 acres have occurred in the Project area within the last 34 years and only 560 total acres (1% of Project area) have burned within that same timeframe (see 3.3.5 Fuels and Fire Management). Altered fire regimes have resulted in major changes to plant community age diversity, structure, and compositions.

Without disturbance, these invading pinyon-juniper woodlands have matured and expanded leading to increased fuel loading and greater potential for catastrophic wildfire. Additionally, when pinyon-juniper expand into sagebrush steppe habitats, they outcompete understory species for light, moisture, and nutrients. This cycle eventually results in nearly complete loss of valuable understory vegetation species such as sagebrush, grasses and forbs. The altered condition affects soils, vegetation structure and composition, water, nutrient and fire cycles, forage production, carbon storage, and plant and wildlife biodiversity. Bare ground tends to increase in tree-invaded sites, leading to soil loss due to wind and water erosion (Connelly et al. 2000; Aldrich et al. 2005; Pierson et al. 2007, 2010; Davies et al. 2011).

Well-developed biological soil crusts (BSCs) are often found in these locations, but generally are not enough to substantially reduce water flow. Increase in overland flow of water leads to the formation of numerous deep, incised channels that further erode and eventually drop the water table in the area. Increases in woodland cover often restrict soil water availability, which in turn shortens the growing season and limits the amount and quality of forbs and grasses available for cover and food utilized by wildlife, including elk (*Cervus elaphus*), pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), and greater sage-grouse (GRSG; *Centrocercus urophasianus*) (Williams et al. 2017). Species that are dependent upon sagebrush habitats for their life requirements (sagebrush obligates) often experience population declines, are forced to move to new areas (if available), or in many cases, are extirpated from the area. Research has not identified any wildlife species that are obligates to closed-canopy pinyon-juniper woodlands. Cumulative effects of changes contribute to depleted ecosystems and decline of both plant and wildlife species richness.

Existing patterns of vegetation within the Project area are not conducive to favorable effects from fire without the intervention of treatments such as those proposed in this Project (see Example Management Options for Condition Class 3 in Appendix B, Fire Regime Condition Class Definition). Hazardous fuels currently need to be managed to protect vegetation and soils from uncharacteristic, severe wildfire. Goals of woodland management include the restoration of ecosystem function and a more diverse and balanced plant community that includes shrubs, grasses, and forbs, and increased ecosystem resilience to disturbances.

Adding to the impacts of the current condition is the uncertainty of climate change. Climate models generally predict a warming and drying trend for the region. Although there are numerous models with variation in predicted changes, consistent patterns emerge. Many models predict that sagebrush will respond positively to climate change at the coldest locations but is more likely to respond negatively at the warmest sites. Across much of the range of sagebrush, models consistently predict negligible or positive responses to climate change. Concerns about climate change impacts to sagebrush should not preclude land management agencies from investing in sagebrush conservation and restoration (Adler et al. 2018). Maintaining the resiliency of the sagebrush steppe ecosystem, while creating a mosaic of potential habitat for species to adapt to changing conditions is critical for their long-term survival. While we cannot predict exactly how species will use this habitat, creating conditions that are important during different life stages (winter habitat, breeding, rearing of young) or during extreme weather events will serve to provide species with options for their increased and continued use of the Project area (Brooks and Chambers, 2011; Chambers et al., 2013, Adler et al., 2018).

1.3 Purpose and Need for the Proposed Action

The purpose of the Project is to improve land health, enhance sagebrush-steppe habitat, and return vegetative condition to a state that more closely resembles the historical fire regime. This would be accomplished by conducting a variety of vegetation treatments to reduce pinyon-juniper extent and density and diversify existing sagebrush stands throughout the Project area. A variety of resource management tools such as mechanical and chemical treatments, prescribed fire, and seeding are proposed to achieve this purpose. The need for the Project is to implement past and current planning direction for the area, which calls for protecting wildlife habitat, and migration corridors, meeting objectives outlined in adopted species management plans, and improving land health.

The need to restore vegetation communities within the Skutumpah Terrace has been recognized by numerous stakeholders for many years. Numerous resource management plans have addressed resource and vegetation management needs within this area to reduce pinyon and juniper expansion into crucial wildlife habitats and along the wildland urban interface (WUI) for decades. Many of these plans have recently been revised and continue to call on stakeholders to coordinate efforts for habitat restoration in this area.

Plans specifically mentioning the need for sagebrush steppe restoration include:

- U.S. Fish and Wildlife Service (USFWS) Greater Sage-Grouse Conservation Objectives Final Report (2013);
- Conservation Plan for Greater Sage-grouse in Utah (UDWR 2013);
- Color Country Greater Sage-Grouse Local Working Group Conservation Plan (Frey et al. 2006);
- Utah BLM Greater Sage-Grouse Resource Management Plan Amendment (2015);
- Kanab Watershed Coordinated Resource Management Plan (Goldberry 2015);
- Utah Division of Wildlife Resources (UDWR) Statewide Management Plan for Mule Deer (2014) and Elk (2015a);
- Paunsaugunt Mule Deer Management Plan (2015);
- Paunsaugunt Elk Management Plan (2016);
- Southern Utah Support Area (SUSA) Fire Management Plan (2005);
- Kane County Resource Management Plan (2017).

Currently, BLM Utah, in partnership with Utah's Watershed Restoration Initiative (UWRI), has taken the lead in identifying priority watersheds throughout the state, to address a variety of interdependent resource issues and improving long-term watershed conservation and restoration. These watershed focus areas, such as the Skutumpah Terrace Project area, are targeted and prioritized for funding through BLM program

dollars, with additional coordination and funding prioritized through the Southern Region Utah Partnership for Conservation and Development (UPCD) team.

An Interdisciplinary Team (IDT) composed of BLM resource personnel, state and county officials, and technical experts from the UDWR and Natural Resources Conservation Service (NRCS) have identified restoration opportunities within the Project area which include:

- Reducing hazardous fuels and risk to life and property from catastrophic wildland fire;
- Restoring and improving the sagebrush-steppe ecosystem;
- Increasing plant species diversity and improving watershed conditions and water quality;
- Improving the health of both woodland and sagebrush/grasslands by increasing vegetation diversity as well as age class and structure;
- Enhancing important seasonal and year-around habitat for several species of wildlife including but not limited to sage-grouse, mule deer, elk, and pronghorn antelope;
- Decreasing the amount of pinyon-juniper expansion into areas historically dominated by sagebrush and grass; and
- Protecting and maintaining unique plant communities (ponderosa pine, oak, manzanita).

These treatments would be implemented in numerous phases over approximately a 15-year period at an average of about 2,000 acres per year, as discussed in the Proposed Action and Alternatives in Chapter 2.

1.4 The Decision to be Made

The GSENM and KFO will decide whether to authorize 1) the Proposed Action, or 2) the No Action alternative.

1.5 Conformance with BLM Land Use Plan(s) and Monument Proclamations

The Proposed Action is in conformance with the applicable Land Use Plans (LUPs) because it is specifically provided for in the following LUP decisions:

Grand Staircase-Escalante National Monument Management Plan. Approved Feb. 2000.

- FW-1 *"the BLM will manage habitats for the recovery or reestablishment of native populations through collaborative planning with local, State and Federal agencies, user groups, and interested organizations"* (Page 12);
- FW-3 *"The BLM will continue to work with the UDWR to meet the goals described in adopted species management plans"* (Page 12);
- FW-5 *"The BLM will preserve the integrity of wildlife corridors, migration routes and access to key forage, nesting, and spawning areas"* (Page 12);
- FW-8 *"The BLM will continue to coordinate with the UDWR and other organizations to inventory for wildlife and to evaluate needs for habitat protection"* (Page 12);
- RM-1 *"Mechanical methods, including manual pulling and the use of hand tools (e.g., chainsaws, machetes, pruners) may be allowed throughout the Monument"* (Page 26);
- RM-2 *"The use of machinery (e.g., roller chopping, chaining, plowing, disking) may be allowed in all zones except the Primitive Zone"*
  - *"this method (chaining) will not be used to remove pinyon and juniper"* (Page 26);
- RM-4 *"chemicals may also be allowed in conjunction with research projects and must lead to the achievement of the overall vegetation objectives"* (Page 27);
- RM-7 "*vegetation monitoring plots will be established to determine the effectiveness of the treatments in achieving management objectives and to provide baseline data of overall change"* (Page 27);
- NW-3 *"An array of methods will be used as appropriate for the control of specific noxious weed species. These methods include: the use of chemicals (aerial spraying, hand spraying, and painting),*

hand cutting, biological control agents, and manual pulling. Each of these methods has a place in the control of these invasive species and will be evaluated for their effectiveness as eradication projects are designed" (Page 27);

- NAT-1 *"native plants will be used as a priority for all projects in the Monument"* (Page 30);
- NAT-2 *"Non-native plants may be used in limited, emergency situations where they may be necessary in order to protect Monument resources by stabilizing soils and displacing noxious weeds. In these situations, short-lived species (i.e., nurse crop species) will be used and will be combined with native species to facilitate the ultimate establishment of native species"* (Page 30);
- NAT-4 *"Non-native plants may be used for restoration related research if the use is consistent with and furthers the overall vegetation management objectives, including NAT-2 above, and after consultation with the GSENM Advisory Committee"* (Page 30).

Proclamation 9682 of Dec. 4, 2017

- *"consistent with the care and management of the objects . . . the Secretary may authorize ecological restoration and active vegetation management activities in the monument".*

Utah Greater Sage-Grouse Approved Resource Management Plan Amendment. Approved Sept. 2015.

- SSS-3 "*In all GRSG habitat, where sagebrush is the current or potential dominant vegetation type or is a primary species within the various states of the ecological site description, maintain or restore vegetation to provide habitat for lekking, nesting, brood rearing, and winter habitats*" (Pages 2-3);
- SSS-4: "*Within PHMA, increase the amount and functionality of seasonal habitats by:*
    - *Reducing conifer (e.g., pinyon/juniper) from areas that are most likely to support GRSG at a rate that is at least equal to the rate of encroachment;*
    - *Maintaining or improving corridors for migration or movement between seasonal habitats, as well as for long-term genetic connections between populations;*
    - *Maintaining or improving understory (grass, forb) and/or riparian condition within breeding and late brood-rearing habitats;*
    - *Conducting vegetation treatments based on the following 10-year (decadal) acreage objectives:"*

Population Areas	Mechanical Treatment[1]	Annual Grass Treatment[1]
Box Elder	9,300	17,800
Ibapah; Hamlin Valley	17,900	2,100
Rich; Uintah	40,700	6,800
Carbon	2,600	200
Bald Hills; Panguitch	43,900	8,900
Parker Mountain	32,800	2,200
Sheeprocks	33,700	10,000
Statewide	*180,900*	*48,000*

[1] These acreage figures, based on Vegetation Dynamics Development Tool modeling, represent an objective for treatment on BLM-administered lands over a 10-year (decadal) time frame to support achievement or progress toward GRSG habitat objectives (see Final EIS Appendix V, Great Basin Vegetation Modeling using Vegetation Dynamics Development Tool). This accounts for variations in yearly funding availability and does not reflect a maximum or minimum acreage for any one treatment type or total treatment acreage, should funding and site specific conditions allow for more or less treatment acreage than described in order to meet habitat objectives.

- SSS-4 Continued*: "Outside PHMA (in adjacent Opportunity areas) improve and restore historical GRSG habitat to support GRSG populations and to maintain or enhance connectivity. Statewide, complete a decadal average of 170,200 acres of mechanical treatments and 33,000 acres of annual grass treatments"* (Pages 2-6, 2-7);
- SSS-5: *"Participate in local GRSG conservation efforts (e.g., the appropriate State of Utah agency, Natural Resources Conservation Service (NRCS), and local working groups) to implement landscape-scale habitat conservation, to implement consistent management to benefit GRSG, and to gather and use local research and monitoring to promote the conservation of GRSG"* (Page 2-7);

- MA-SSS-4: *"In PHMA and in adjacent Opportunity areas, maintain, improve and restore GRSG habitat to support GRSG populations and to maintain or enhance connectivity"* (Page 2-12);
- VEG-1: *"In . . . PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70 percent) with a minimum of 15 percent sagebrush cover or as consistent with specific ecological site conditions"* (Page 2-15);
- MA-VEG-1: *"In PHMA, where necessary to meet GRSG habitat objectives, treat areas to maintain and expand healthy GRSG habitat (e.g., conifer encroachment areas and annual grasslands). In PHMA, prioritize implementation of restoration/treatment projects based on environmental variables that improve chances for Project success in areas most likely to benefit GRSG (e.g., proximity to existing GRSG populations, ecological site potential, and resistance and resilience). Use collaborative planning efforts to develop and implement habitat restoration projects. Expertise and ideas from entities such as local landowners, local GRSG working groups, and other federal, state, county, and private organizations shall be solicited and considered in development of restoration projects"* (Page 2-15);
- MA-VEG-2: *"Remove conifers encroaching into sagebrush habitats, in a manner that considers tribal cultural values. When conducting conifer treatments:*
    - *Prioritize treatments closest to occupied GRSG habitats and near occupied leks, and where juniper encroachment is phase I or phase II;*
    - *Treat areas in late Phase II or Phase III condition to create movement corridors, connect habitats, or to break up continuous, hazardous fuels and reduce the potential for catastrophic fire;*
    - *Prioritize methods to reduce conifer canopy cover to those that maintain the understory vegetation as the preferred treatment methods (e.g., mechanical, lop and scatter);*
    - *Require that vegetation treatments conducted within 0.6 miles of a lek include an objective of reducing conifer, where technically feasible, to less than 5 percent canopy cover, with preference for complete removal;*
    - *Include stipulations to avoid removing old-growth pinyon-juniper stands (e.g., Tausch et al. 2009; Miller and Rose 1999)"* (Page 2-16).
- MA-VEG-5: *"In PHMA, prioritize the use of native seeds for restoration based on availability, adaptation (ecological site potential), and probability of success. Where probability of success or adapted seed availability is low, desirable non-native seeds may be used as long as they support GRSG habitat objectives. Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, should be the principle objective for rehabilitation efforts"* (Page 2-17);
- MA-VEG-9: *"In PHMA, diversify the perennial grass and forb components through additional seeding in areas where historical seedings (e.g., crested wheatgrass) have been recolonized by sagebrush"* (Page 2-17).

Southern Utah Support Area Fire Management Plan. Approved 2005.
The Project area falls within the East Sands, Glendale Bench and Big Deer Fire Management Units (FMUs). FMU objectives supporting the Purpose and Need outlined for the Project are:

- East Sands FMU: *"Using prescribed fire and non-fire fuels Projects, convert 6600 acres of juniper and 560 acres of pinyon-juniper to sagebrush/grass, 1380 acres of sagebrush and 681 acres of sagebrush/perennial grass for age class diversity objectives";*
- Big Deer FMU: "*convert 50,000 acres of pinyon and juniper woodland, 25,000 acres of juniper and 20,000 acres of sagebrush to sagebrush/perennial grass using wildfire, prescribed fire and non-fire fuels treatments*";
- Glendale Bench FMU: "*Improve ponderosa pine vigor and reproduction by reducing competition from pinyon and juniper woodland using prescribed fire and/or non-fire fuels treatments. Convert pinyon and juniper woodlands to sagebrush grassland using natural fire, prescribed fire and mechanical treatment. Convert juniper to sagebrush grassland using natural fire, prescribed fire and*

mechanical treatment. Convert sagebrush using mechanical methods; create a mosaic of age classes in the sagebrush and sagebrush perennial grassland vegetation types."

1.6 Relationship to Statutes, Regulations, or Other Plans

The Proposed Action is in conformance with the following statutes, regulations, and other plans:

- Kane County Resource Management Plan (2017);
- Final Vegetation Treatments on BLM Lands in 17 Western States Programmatic Environmental Impact Statement and Associated Record of Decision (ROD) (2009);
- Kane County, Utah, General Plan (2013);
- BLM National Greater Sage-Grouse Planning Strategy (2012);
- Federal Land Policy and Management Act (FLPMA) As Amended (1976);
- Taylor Grazing Act of (TGA) of 1934;
- Endangered Species Act (ESA) of 1973 (as amended);
- Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended);
- IM 2017-007, Guidance for Utah Bureau of Land Management to Meet Responsibilities under the Migratory Bird Treaty Act (MBTA) and Executive Order 13186 (2017);
- Treaty relating to the utilization of waters of the Colorado River (1944);
- Utah Wildlife Action Plan (2015).

1.7 Identification of Issues

Internal scoping was accomplished by a team of resource specialists who reviewed the proposed Project, made effects determinations, and provided comments regarding issues. Appendix C contains the BLM ID Team Checklist of all resources considered, including the rationale for dismissing resources from further analysis in this EA.

External scoping was accomplished by notifying the public of the Project through a notice posted on the BLM ePlanning Register and a scoping letter sent out to interested individuals and organizations on November 21, 2016. A news release was also published in local newspapers to solicit comments. During the public scoping process, the title of the Project was the "Skutumpah Terrace Sage-grouse Habitat Restoration Project", and the Purpose and Need dealt strictly with land treatments to benefit GRSG. Comments on scoping were requested back to the BLM by December 22, 2016, although BLM continued to receive and accept comments well beyond the 30-day comment period. BLM received 38 comment letters back from groups and individuals including tribes, county governments, the State of Utah, special interest groups, universities, local ranchers, local residents and other interested entities.

The BLM, recognizing that other agencies have specific knowledge, expertise, and stake in the proposed Project, solicited cooperating agency status. On August 10, 2017, a cooperating agency Memorandum of Understanding (MOU) between GSENM and the State of Utah was signed. Partner agencies such as the Natural Resource Conservation Service (NRCS), and Utah Division of Wildlife Resources (UDWR), are also an important part of the planning effort and have been involved in various stages of Project development.

During the scoping process, many of our partners expressed concern about species-specific project planning (for sage-grouse) and suggested that the Purpose and Need be adapted to be more inclusive of other sagebrush steppe wildlife species and include landscape-level analysis. The BLM accepted these suggestions and modified the title, Purpose and Need, extent, and general focus of the planning document to accentuate the importance of this habitat type (sagebrush steppe) as opposed to a single species that uses this habitat (sage-grouse).

After preparation of the draft EA, the public was notified on November 2, 2018 of its availability for review. This was done through BLMs E-planning website as well as through a letter sent out to approximately 100 interested publics. The public was given until December 3, 2018 to submit comments. During review of the draft EA (November 2 to December 3, 2018), the BLM received a total of 14 comment letters from groups and individuals (see section 4.3.1 - Comment Analysis and Response to Public Comment). During the scoping and draft EA review process, the following resources and critical elements of the human environment that may be affected by the proposed Project were identified as issues (i.e., an environmental problem or relation between a resource and an action, or resources that could be affected by implementation of the proposed Project). These issues are introduced briefly below and will be carried forward for further analyses in chapter 3.

Issue A: Air Quality

- The Proposed Action has the potential in the short-term to increase airborne dust thus affecting air quality.

Issue B: Soil and Biological Soil Crusts (BSC)

- Use of machinery could harm fragile BSCs;
- Treatments should match ecological potential based on soil-type;
- Removal of vegetation and disturbance to soils and soil crust could affect wind and water erosion and dust;
- Erosion could increase on treated areas until vegetation re-establishes.

Issue C: Cultural Resources and Native American Religious Concerns

- Fragile cultural resources may be present within the proposed Project area and could potentially be impacted by the Proposed Action.

Issue D: Fish and Wildlife including migratory birds

- The Proposed Action could impact wildlife species that utilize pinyon-juniper habitats;
- Treatment activities could disturb or disrupt wildlife movements, use patterns or reproduction;
- Habitats could be altered, no longer allowing certain species to utilize the area. Other species like GRSG, mule deer, or other sagebrush obligate species could benefit from the Project;
- Migratory birds within the Project area could be impacted by the Proposed Action.

Issue E: Fuels/Fire Management

- Fire regimes and condition classes could be altered by the Proposed Action;
- Increase in fine fuels (grasses or forbs) in treated areas may carry fire more efficiently than the current condition;
- Fire frequency has the potential to increase in treated areas.

Issue F: Hydrologic Conditions and Water Resources/Quality

- Hydrologic conditions could be affected by the Proposed Action;
- Springs, seeps or other riparian areas could see an increase in water outflow;
- New water sources may emerge as a result of the Proposed Action.

Issue G: Invasive Species/Noxious Weeds

- Machinery and fire can remove existing vegetation, providing a disturbed area which could be colonized by noxious weeds.

Issue H: Livestock Grazing

- Livestock grazing could be affected by the Proposed Action;
- Non-use of cattle allotments would be required after Project implementation;

- Would cattle be allowed to return to the Project area after treatment? How soon?

Issue I: Rangeland Health
- How would this Proposed Action affect rangeland health standards? How will this be monitored?

Issue J: Recreation
- The Proposed Action could potentially affect recreation and tourism on the Monument. Some visitors may avoid the Project area during and after treatment;
- Camping opportunities within the Project area could be affected by the Proposed Action;
- Special Recreation Permit (SRP) holders who operate within the Project area may have interruptions in their normal services or activities.

Issue K: Lands with Wilderness Character (LWC)
- Some of these lands have already been found to contain wilderness character. The Proposed Action could impact wilderness characteristics (naturalness and outstanding opportunities for solitude and/or primitive and unconfined recreation) within the Upper Kanab Creek LWC unit.

Issue L: Woodland/Forestry
- Although there are no mapped "old growth" trees within the Project area, there may be trees in excess of 150 years that could potentially be removed;
- Pinyon and juniper current extent, density and structure would be altered by the Proposed Action.

Issue M: Vegetation
- Current vegetation communities could be altered by the Proposed Action;
- Vegetation condition could generally be expected to return to an earlier seral stage;
- Tree cover would be substantially reduced within treated areas;
- Would areas receiving treatments be seeded prior to Project implementation? What type of seed would be used, native or non-native?
- The Proposed Action could affect the way vegetation captures and sequesters carbon from the atmosphere.

Issue N: Visual Resources
- Removal, manipulation or burning of large stands of vegetation (predominantly pinyon and juniper), especially in areas of high viewer sensitivity (i.e. along Johnson Canyon/Alton Amphitheater State Scenic Backway and other roads) has the potential to create visual impacts to the degree that the existing landscape character is altered;
- Removal or manipulation of large stands of vegetation (predominantly pinyon and juniper) has the potential to attract the attention of casual observers beyond what is allowable per Visual Resource Management (VRM) Class objectives.

1.8 Summary

This chapter has presented the Purpose and Need of the proposed Project, as well as the relevant issues to be addressed. In order to meet the Purpose and Need of the proposed Project in a way that addresses the issues, the BLM has considered and/or developed a range of alternatives (including the Proposed Action). These alternatives are presented in Chapter 2. The potential environmental impacts or consequences resulting from the implementation of each alternative considered in detail are analyzed in Chapter 3 for each of the identified issues.

2 DESCRIPTION OF ALTERNATIVES INCLUDING PROPOSED ACTION AND NO ACTION

2.1 Introduction

This EA focuses on the Proposed Action and No Action alternatives. One additional alternative was proposed during the review of the draft EA but was eliminated as discussed below in section 2.5 as well as in Appendix F, BLM Response to Comments. The No Action alternative is considered and analyzed to provide a baseline for comparison of the impacts of the Proposed Action. The Proposed Action alternative was developed based on a number of factors, including ecological site descriptions, site visits, and input from the BLM ID Team and cooperating agencies. To provide a context for the alternatives, a summary of the expected natural vegetation, existing vegetation, degree of departure, and management opportunities are outlined below.

2.1.1 Expected Natural Vegetation Derived through Ecological Site Potential

Under a normal disturbance regime, there are three major expected vegetation types within the Project area: 1) Big Sagebrush (35,697 acres), 2) Pinyon-Juniper (13,717 acres), and 3) Juniper-Pinyon (3,530 acres) (the latter two are referred to collectively in this document as "pinyon-juniper"). The expected vegetation is derived from ecological site data (see Figure A2, Appendix A, Project Area Potential Vegetation). Within these potential dominant vegetation types, there are minor inclusions of other vegetation types such as oak, ponderosa pine, and manzanita that may be present on the sites but in very limited quantities.

Ecological sites are the basic component of a land-type classification system that describes ecological potential and ecosystem dynamics of land areas. Ecological sites contain specific soil and physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and its ability to respond similarly to management actions and natural disturbances. They are classified considering physical factors such as soils, climate, hydrology, geology, and physiographic features. They also consider biotic factors such as plant species occurrence, plant community compositions, annual biomass production, wildlife-vegetation interactions, and other factors (NRCS 2018). There are seven distinct ecological sites within the Project area. Each of these ecological sites has a potential dominant vegetation type associated with it. Under normal ecological conditions, nearly 2/3 of the Project area (64%) should be dominated by sagebrush. Whereas about 1/3 (31%) should be dominated by pinyon-juniper (see Figure A3, Appendix A, Project Area Ecological Sites).

2.1.2 Existing Vegetation

Existing vegetation for the Project area is derived from LandFire, which uses decision tree models, field data, Landsat imagery, elevation, and biophysical data (https://www.landfire.gov/evt.php). According to this dataset, the major vegetation types currently present in the Project area are 1) pinyon-juniper woodland (37,347 acres), sagebrush (4,255), grassland/sagebrush (2,595), oak/serviceberry shrub (774 acres) and ponderosa pine (109 acres) (see Figure A4, Appendix A, Project Area Existing Vegetation Types)[1].

2.1.3 Degree of Departure

When comparing the expected vegetation to the existing vegetation types currently found within the Project area, it becomes apparent that this landscape is highly departed from normal. Pinyon-juniper is dominant on 68% of the Project area or more than twice as dominant as expected. Conversely, sagebrush, the expected

[1] Data presented includes only the major vegetation types produced by this dataset. Other vegetation types were not included as they are small percentages or components of the overall Project area.

dominant vegetation, with the ecological potential to dominate on 64% of the Project area, occurs on only 12.4% of the Project area (see Table 1).

Table 1. Degree of Departure from Normal Vegetation.

Vegetation Cover Type	Expected Acres	Current Acres	Expected Percent Vegetation Type	Current Percent Vegetation Type	Percent of Normal
Big Sagebrush or Grassland/Sagebrush	35,697	6,850	64%	12.4%	19%
Pinyon-Juniper	17,247	37,347	31%	68%	217%

2.1.4 Management Opportunities

In order to move the existing vegetation from its current highly departed state (current condition) to a state that more closely resembles its natural ecological potential (desired future condition), three basic treatment types are outlined below for the Project area. Also see Figure A5, Appendix A, Project Proposed Treatment Areas, for a graphic representation of these treatment areas.

Treatment Type 1: Pinyon-Juniper Reduction

Location and Potential Extent within Project area

The vast majority of this treatment type (about 85%) would be taking place within Sagebrush/grassland ecological sites. These sites are generally found in well-developed and deep soils, typical of valley bottoms, gently sloping terrain, structural benches, or on mesa tops. Sagebrush and grass are also components of pinyon-juniper ecological sites, especially on mild slopes (<30%) and in early seral stages recovering from disturbances such as fire. A small percentage of this treatment type (about 15%) would also occur in pinyon-juniper sites, especially in GRSG habitat where '*the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70 percent) with a minimum of 15 percent sagebrush cover or as consistent with specific ecological site conditions'* (ARMPA 2015).

Current Condition

Vegetation composition within sagebrush/grassland ecological sites has changed from healthy sagebrush stands with perennial grasses and forbs to scattered, decadent sagebrush pockets with an overstory of pinyon-juniper. Pinyon-juniper has encroached into sagebrush/grasslands, pockets of ponderosa pine stands, and oak/mountain shrub communities. Pinyon-juniper ecological sites have matured and become dense, limiting available sunlight, moisture and nutrients needed by understory vegetation. The high density of trees has created a closed canopy with little or no opportunity for future recruitment of sagebrush or other desired understory vegetation. Upland erosion has increased, resulting in reduced soil moisture and decreased groundwater recharge (see Section 3.3.7 Rangeland Health). Sagebrush steppe wildlife species such as GRSG, mule deer, and a host of migratory birds, have experienced decrease in habitat condition and availability. Figures 1 and 2 below are representative of the current extent of pinyon-juniper encroachment and infilling throughout the Project area.

The majority of the Project area within these ecological sites is currently in fire condition class 3 (93% of Project area), where vegetation communities and fire regimes have been 'significantly altered' from historic regimes and the risk of losing key ecosystem components is high. These areas are susceptible to high intensity wildfire and cheatgrass (*Bromus tectorum*) invasion following wildland fires (see Figures 1 & 2).

Figure 1. Current Condition. Pinyon and juniper encroachment into sagebrush/grassland ESDs within the Project area. Understory grasses and forbs are no longer present. Sagebrush is beginning to die. Bare ground has increased, and rills and gullies are forming due to increased erosion.

Figure 2. Current Condition. Ponderosa stands (left) are invaded and surrounded by pinyon-juniper and at risk of fire loss. Encroached sagebrush flats have increased erosion and the formation of large gullies (right).

Desired Future Condition

The majority of the Project area matches the potential based on ecological site data. The majority of the Project area is in FRCC 1 or in line with normal historical conditions. Mosaics of vegetation, with stands of mature and young sagebrush steppe, perennial grasslands, wet meadows, seeps, healthy riparian vegetation interspersed with ponderosa pine stands, oak/mountain shrub and healthy woodlands exist throughout the Project area. Precipitation infiltrates into the ground and recharges the water table. Mass erosion events are rare and consistent with historical frequencies. Available ground water is near the surface and available to plants and wildlife. There is increased vigor of sagebrush as indicated by plants with leader, leaf, and seed production in balance with climatic conditions. Desirable grasses, forbs and shrubs compete with and keep the weed and cheatgrass component of the understory at acceptable levels. The landscape is healthy and resilient to disturbances. Wildlife species are in balance with the ecosystem and have all necessities to complete their life-cycles. Reproduction and recruitment are at levels sufficient to maintain population viability.

Ponderosa pine, oak and other unique vegetation exists in isolated pockets throughout the habitat type. Ponderosa pine Stands experience normal levels of mortality and are resilient to low intensity fire. Pinyon-juniper stands exist on woodland ecological sites across the landscape in a variety of conditions, including young regenerating stands, mid-aged stands, and mature stands. Pinyon-juniper stands provide hiding and

thermal cover for wildlife species. Figure 3 depicts how treated sites would look as a mosaic of treated and untreated vegetation matching desired future condition.

Figure 3. Desired Future Condition. Pinyon-juniper treatment in a historical sagebrush steppe site directly adjacent to the Project area before treatment (left) and after treatment (right). Photo on the right represents the desired future condition. Note the increase in understory of perennial grasses and an improvement of sagebrush health after treatment.

Treatment Type 2: Sagebrush Enhancement

Location and Potential Extent within Project area

This treatment type would be taking place within Sagebrush/grassland ecological sites, generally found in well-developed and deep soils. These are typically found in valley bottoms, gently sloping terrain, structural benches, or on mesa tops.

Current Condition

Although sagebrush is present, stands are comprised of older, even-aged, decadent sagebrush plants that have poor nutritional value for browsers. These stands generally lack desirable understory vegetation and have a high occurrence of bare ground (see Section 3.3.7 Rangeland Health). Figure 4 is representative of these types of sites. The majority of the Project area within these ecological sites is currently in fire condition class 3 (93% of Project area), where vegetation communities and fire regimes have been 'significantly altered' from historic regimes and the risk of losing key ecosystem components is high. The potential for stand replacing catastrophic wildfire is high. The risk of invasion of annual grasses such as cheatgrass is high.

Figure 4. Current Condition. Representative sagebrush enhancement treatment sites within the Project Area. Note the lack of understory, age class diversity, decadent and dying sagebrush, and increased exposure of bare ground. Pinyon and juniper are nearing the site.

Desired Future Condition

Sagebrush communities exist as multiple age class stands with a perennial grass and forb understory consistent with ecological site descriptions (see Figure 5). Sagebrush is vigorous as indicated by plants with leader and leaf growth, and seed production in balance with climatic conditions. A diversity of vegetation competes with and keeps the weed and cheatgrass component of the understory at acceptable levels. The sagebrush communities are in FRCC 1. The potential for catastrophic wildfire is low and site resilience to disturbance is high. Wildlife species using sagebrush steppe are in balance with the ecosystem and have all necessities to complete their life cycle. Reproduction and recruitment are at levels sufficient to maintain population viability.

Figure 5. Desired Future Condition. Recent sagebrush treatments on GSENM resembling desired future condition for sagebrush enhancement Project areas (Petrified Hollow on left, Sand Gulch on right). Note the increase of native perennial grasses and sagebrush age class diversity. Pronghorn and other sagebrush species have begun to re-inhabit these lands.

Treatment Type 3: Maintenance of Previously Treated Lands

Location and Potential Extent within Project area

This treatment type would be occurring on lands that were previously treated. These previously treated lands are found primarily on sagebrush/grassland sites where there are well developed and deep soils. These are typically found in valley bottoms, gently sloping terrain, structural benches, or on mesa tops. Past treatments were originally designed to improve grass/forb communities by removing invading pinyon-juniper or reducing sagebrush densities. These treatments primarily consisted of chaining. Several small prescribed fires followed by seeding have also occurred.

Current Condition

Many of these past treatments have received no form of disturbance whether manmade or natural for many decades. Plant succession has returned these sites to a late seral vegetation state and in many cases, pinyon and juniper are once again taking over the sites (Figure 6). Where maintenance has occurred, these areas are some of the best remaining sagebrush/grassland habitat within the Project area. Maintained treatments contain a more diverse age class of sagebrush, have a residual perennial grass and forb understory, and are the only areas within the Project area that GRSG currently use.

As evidenced by remote sensing, these areas much more closely resemble the expected natural vegetation than untreated areas. These sites are generally within FRCC 2, or moderately departed from normal.

Figure 6. Current Condition. Previously treated areas that have not been maintained (past 50 years). Pinyon-juniper or dense shrub cover has returned to the sites, reducing understory vegetation and leading to sagebrush mortality.

Desired Future Condition

Previously treated lands throughout the Project area are diverse in composition, age class and structure. Low intensity periodic fire and a variety of land management treatments are used to maintain the ecological integrity. Pinyon and juniper are generally not found within past treatments except in small pockets in the appropriate ecological site. Movement corridors are present to allow the movement of wildlife between varying habitat types. Because of the cost and effort already invested, and the relatively low cost to maintain these areas, they are high priority for maintenance. Potential for success is high and the cost and effort to maintain these areas is greatly reduced.

In the past decade, some maintenance of these treated areas has occurred using chain saws or masticator mulchers to remove invading trees. These small maintenance treatments quickly showed site improvement and give confidence that future treatments will also be successful (Figure 7, Table 2).

Figure 7. Desired Future Condition (right): Vegetation re-treatment on First Point (within Project area) using the hand-thin method. Photo on left depicts the monitoring plot pre-treatment. Photo on right depicts the same plot post-treatment.

Table 2. First Point Vegetation Re-treatment: Before and After

Monitoring Year	Ground Cover		Vegetative Cover			
	Bare Ground	Litter	Shrub	Perennial Grass	Forb	Juniper
Pre-Treatment (2011)	**38%**	**54%**	**5%**	**< 5%**	**< 1%**	**32%**
Post Treatment (2016)	**24%**	**64%**	**> 7%**	**> 12%**	**> 2%**	**0%**

2.2 Alternative A – Proposed Action

To address the Purpose and Need for the Proposed Action, the BLM ID Team developed three landscape treatment prescriptions (Figure A5, Appendix A). These prescriptions (described below and in Table 3) would move the existing vegetation from its current condition to the desired future condition.

Table 3. Acres treated as part of Alternative A, Proposed Action (by Ecological Site Potential)

Treatment Type Alternative A – Proposed Action	Acres	Project Area %	Acres and % Within Sagebrush Ecological Site	Acres and % within Pinyon-Juniper Ecological Site
Pinyon-Juniper Reduction	22,526	41%	18,260 ac. or 81%	4,236 ac. or 19%
Sagebrush Enhancement	250	<1%	245 ac. or 98%	5 ac. or 2%
Maintenance of Previously Treated Lands	7,747	14%	7,325 ac. or 95 %	365 ac. or 5%
Total	30,523	55%	25,830 ac. or 85%	4,606 ac. or 15%

Treatment Type 1: Pinyon-Juniper Reduction – 22,526 Acres

- Use approved mechanical tools, chemicals and prescribed fire to:
  - Thin or remove pinyon-juniper on pinyon-juniper ecological sites where sagebrush exists or is a potential understory component;
  - Remove up to 100% of pinyon and juniper trees within sagebrush/grassland ecological sites or GRSG PHMA;
  - Remove ladder fuels and maintain ponderosa pine health;
  - Maintain these treated areas to reduce the potential for future pinyon-juniper encroachment and to protect the investment made by BLM and partners.
- As needed, supplement declining ponderosa pine stands with ponderosa seedlings;
- Reintroduce low-intensity ground fire to ponderosa pine stands to remove ladder fuels (following treatments), as a long-term maintenance strategy;
- Seed treated areas with a diverse mix of native grasses, forbs, and shrubs appropriate for the site prior to treatment. Seed mixes would contain both warm and cool season species to ensure that seeds take advantage of all moisture received whether it be monsoonal or winter;
- Use approved mechanical tools or hand tools to place natural materials (rocks/trees/shrubs), or man-made structures such as beaver dam analogs, check dams or gully plugs into incised channels to slow water flow, capture sediment, reduce erosion, and build the water table.

Treatment Type 2: Sagebrush Enhancement – 250 Acres

- Use approved mechanical tools, chemicals and prescribed fire[2] to:
  - Reduce sagebrush canopy cover to 15-20% within GRSG PHMA and 20% or less in other areas;
  - Change large even-aged sagebrush stands to multiple age structures, and improve native grass and forb density and cover;

[2] Fire would only be used for maintenance, and not for initial treatment.

- Remove up to 100% of pinyon-juniper that are encroaching into these sites;
- Remove 100% of invading pinyon-juniper as a maintenance strategy post-treatment;

- Seed treated areas with a diverse mix of native grasses, forbs, and shrubs appropriate for the site prior to treatment. Seed mixes would contain both warm and cool season species to ensure that seeds take advantage of all moisture received whether it be monsoonal or winter;
- Use approved mechanical tools or hand tools to place natural materials (rocks/trees/shrubs), or man-made structures such as beaver dam analogs, check dams or gully plugs into incised channels to slow water flow, capture sediment, reduce erosion, and build the water table.

Treatment Type 3: Maintenance of Previously Treated Lands – 7,747 Acres

- Use approved mechanical tools, chemicals and prescribed fire to:
  - Remove up to 100% of invading pinyon-juniper;
  - Reduce sagebrush canopy cover to 15-20% within GRSG PHMA and 20% or less in other areas;
  - Change large even-aged sagebrush stands to multiple age structures, and improve native grass and forb density and cover;
- Seed treated areas with a mix of desired grasses, forbs, and shrubs appropriate for the site prior to treatment. Seed mixes would contain both warm and cool season species to ensure that seeds take advantage of all moisture received whether it be monsoonal or winter;
- Use approved mechanical tools or hand tools to place natural materials (rocks/trees/shrubs), or man-made structures such as beaver dam analogs, check dams or gully plugs into incised channels to slow water flow, capture sediment, reduce erosion, and build the water table.

Implementation Schedule

- New treatments would be implemented over an approximately 15-year period in phases likely based on grazing allotment boundaries;
- Maintenance treatments would occur as needed until planning direction changes without need for further analysis;
- Treatments would generally occur between October 1 to March 28;
- On average, approximately 2,000 acres would be treated annually. Additional acreage may be treated depending on funding opportunities and the size of the grazing allotments;
- The ID team will determine the final treatment boundary for each phase on an annual basis and develop an implementation plan with final approval from the authorized officer.

Measurable Treatment Objectives

- In areas not previously treated (treatment types 1 and 2), within five years after treatment:
  - Increase native herbaceous (non shrub/tree) ground cover by 50%;
  - Increase native plant species diversity by 25%;
  - Reduce bare ground cover by 10%.
- In areas that have been previously treated (treatment type 3) within five years after treatment:
  - Increase herbaceous (non shrub/tree) ground cover by 15%;
  - Increase plant species diversity by 15%;
  - Reduce bare ground cover by 5%.

Monitoring

<u>Vegetation</u>

Vegetation monitoring would determine if the broad Project objectives identified in the Purpose and Need as well as the specific measurable objectives listed above are being met and if these restoration sites are making progress towards the overarching goal of achieving Rangeland Health Standards.

Vegetation monitoring plots would be established in each treatment area ahead of that year's scheduled phase. A baseline survey would be conducted for each phase prior to treatment for comparison purposes

with post treatment monitoring. Post-treatment monitoring would begin the growing season following treatment. Monitoring would continue every year after for the first five years and then in five-year increments thereafter.

Once baseline vegetation surveys are completed and seed mixes finalized, specific monitoring plans for each treatment area would be developed. The following approach would be applied:

- Vegetation cover and frequency data would be collected. The reproductive stages of seeded species would be evaluated;
- Ground cover data such as biological soil crusts, rock, litter, and bare ground would be collected (Detailed methods are described in Appendix D of this EA);
- Utilization studies would occur where appropriate to document any changes in use of wildlife before and after treatment.

After two post-treatment monitoring periods, monitoring data would be summarized and the ID team would analyze the results. The grazing permittee would be contacted to discuss the results and degree of progress toward meeting objectives. If monitoring data show that the objectives are met at the end of the second growing season, treatment areas would be available for grazing in the next authorized seasons of use.

If Project success criteria are not met at the end of two growing seasons, the ID team would begin an evaluation of site conditions and development of a site specific contingency plan. The site would be compared to other treatment sites with similar conditions to evaluate the cause and appropriate future actions. Contingencies may include re-treatment using different treatment methods, different seed mixes, or timing of implementation.

Once Project objectives have been met, livestock grazing may resume as outlined in the specific allotment management plans. Annual monitoring for the first five years after treatment, as well as trend monitoring on a five-year rotation, thereafter, will aid the BLM in determining current trends and whether further management actions such as reductions in livestock numbers or changes in season of use are warranted in order to keep the treated areas sustainable. These measures may require additional analysis through separate environmental assessments.

Infiltration, Soil-Moisture, Sedimentation, and Erosion

With assistance from the United States Department of Agriculture (USDA), Agricultural Research Service (ARS), a small and large plot rainfall simulation study would be conducted in treatment areas and control plots to measure treatment effectiveness at improving water infiltration. Sediment traps would also be set up in similar fashion to measure sedimentation rates on treated versus untreated control plots. Soil-moisture probes would also be set up to compare differences in treated versus untreated areas. Overland flow simulations would also be conducted on both treated and controlled plots. This monitoring is subject to annual funding. It is expected that this monitoring and research will lead to an eventual publication in a scientific journal. Study design will be substantially similar to those outlined in prior publications (Pierson et al. 2010, Williams et al. 2018)

Reptile/Amphibian

Southern Utah University (SUU) has a current GSENM science permit to conduct a reptile and amphibian inventory and monitoring study. One component of the study is intensive surveys of three habitat types – pinyon and juniper woodland, sagebrush community, and pinyon and juniper removal sites. Researchers from SUU Biology Department and GSENM biologists have already conducted two field seasons of inventory on reptile and amphibian, and habitat surveys to better understand the impacts of vegetation management particularly the management for sagebrush restoration. Surveys have been

conducted within three habitat types: 1) Pinyon and juniper woodlands 2) Sagebrush community types 3) Sites which have recently undergone pinyon and juniper removal to promote sagebrush establishment.

Study sites are located on areas proposed for treatment to obtain baseline species data, as well as sites that have already been treated by KFO adjacent to this study area. Sites that receive treatment would be monitored for pre and post treatment species differences. Preliminary data suggest that species diversity is four times greater in treated sites versus non-treated sites. The sites are located as close to one another as possible and are matched in terms of size, topography, elevation etc. Sites were chosen based on habitats particularly suited to reptiles and amphibians such as aquatic and riparian habitats, rocky outcrops, and plant community types as well as litter types. A variety of survey techniques are used, including: visual encounter surveys, nocturnal call surveys, cover boards, and road kill and basking surveys. Each site consists of a drift-fence and pitfall array and 10 4'x4' cover boards. Pitfall traps contain 5, five gallon buckets per array. Drift fences are wings of plastic sheeting set up along the ground that intersect lizards and cause them to follow the fence where they would fall into the buckets allowing researchers to retrieve them to measure and to inventory. The plastic wings are secured by stakes driven into the ground. Drift-fences and pitfalls are particularly suited for capturing lizards, while cover boards tend to favor snakes. Pitfall traps are checked daily and used only as long as enough animals are making them effective to collect data.

This study is ongoing and would continue after treatments begin for before/after comparisons. It is expected that this monitoring and research will lead to an eventual publication in a scientific journal.

2.3 Additional Design Features of the Proposed Action

2.3.1 Fire and Fuels

- A prescribed fire plan (Burn Plan) would be prepared in conformance with the BLM's 9214 manual designed to meet resource objectives while containing fire spread to targeted areas, prior to burning within the Project area;
- Pile burning would be conducted in accordance with the SUSA Pile Burn Plan.

2.3.2 Wildlife

- Treatments in occupied GRSG PHMA would:
  - Not allow prescribed fire, in order to preserve existing sagebrush;
  - Be designed to meet objectives for seasonal habitats found in table 2-2 of the 2015 GRSG plan amendment or most recent guidance;
  - Not be completed in sagebrush habitats between November 15 and March 15 to avoid impacts to wintering GRSG unless otherwise approved by the UDWR for GRSG benefit;
- Any raptor nest found within the Project area would be protected and managed according to Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (USFWS 2002);
- Treatments would be scheduled to avoid the peak migratory bird nesting season (April 1 to July 15). Should a need arise to conduct vegetation treatments during this time, the areas to be treated would first be cleared by a qualified biologist within 7-10 days of disturbance. Active nests of migratory birds found during clearances activities would be avoided. After nestlings have fledged, the area would be treated.

2.3.3 Vegetation/Woodland Forestry

- Unique vegetation types within or adjacent to treatment areas such as ponderosa pine, manzanita or oak, would not be targeted for removal. Any removal would be incidental;
- In hand-thin treatments, cut tree debris would not exceed 2 feet in height;

- In mastication treatment areas, average depth of mulch piles will not exceed 4 inches to avoid restriction of understory vegetation growth;
- Old growth pinyon-juniper stands would be identified using the guidelines set forth in Appendix E Woodland Tree Growth Form and Morphological Characteristics, (Tausch et. al 2009). Stands would be left intact to the extent practicable to meet the purpose and need for the Project;
- Prior to each phase implementation, a pedestrian survey would be conducted for sensitive plants in known and potential habitat areas. Any populations found would be avoided according BLM Manual 6840 unless treatments are determined to benefit the species;
- Prescribed burning would be avoided in areas where rabbitbrush (*Ericameria* sp.) occurs in dense plots.

2.3.4 Seed Selection/Seeding Methods

- Aerial application prior to treatment is the preferred method of seeding and is the most likely to be used. This would be accomplished using a helicopter or fixed-wing aircraft;
- Seeding with a hopper behind a tractor or in front of a rangeland drill may occur in limited circumstances where small Project areas don't justify the cost for aerial application or along incised channels where natural debris may be pushed in to reduce erosion;
- In treatment areas, native seed would be used as a priority except in limited circumstances for:
  - Research plots to determine treatment effectiveness with native/non-native seed;
  - Situations where non-native seed may better outcompete invasive species;
  - Previously treated areas where non-native monocultures would be interseeded with a native/non-native mix to add diversity.
- Local cultivars would be used to the extent they are available. Cultivars selected would be the most closely applicable to the site.

2.3.5 Visual Resources

- Treatment area boundaries and associated edges would be designed annually ahead of each phase in consultation with the Visual Resource Specialist. Visual Contrast Ratings would be prepared in all Class II areas visible from main roads to ensure VRM objectives are met;
- Treatment area boundaries would be designed to reduce unnatural appearing edges, especially along travel corridors and administrative and private property boundaries;
- Treatment area boundaries would strive to mimic the natural edges created between different vegetation communities after fire;
- Fire treatments would be designed and implemented to closely resemble natural fire burn patterns to the degree possible;
- Untreated areas around archeological sites, sensitive plant species habitat, and dispersed camping sites would be connected when feasible to larger untreated areas such as steep slope locations and would be large enough so as not to appear unnatural, or as isolated islands of vegetation. The edges of these untreated areas would be designed as noted above;
- Where the treatment boundary is a road, edges would be designed so both sides of road appear similar (i.e. dense stands of trees on one side of road and few to no trees on other would be avoided).

2.3.6 Recreation

- No new permanent roads would be constructed as part of this Project;
- Temporary access roads would not be opened for public use after treatment;
- Project activities would be posted at visitor centers, trailheads or on-site to inform area users of the ongoing work and the potential interruptions to recreational activities;
- SRP-holders who operate within the Project area would be notified in advance of annual work phases, in order to adjust their operations as necessary;

- During the development of annual work phases, the Recreation Specialist would help to identify any high-use camping locations and evaluate treatment options. To the extent practicable, treed areas around selected campsites would be left untreated to provide shade and seclusion for recreationists. These untreated areas would be of sufficient size and design to comply with the VRM objectives outlined above.

2.3.7 Noxious Weeds

- All machinery would be weed-washed with a high-pressure system prior to entering federal lands. All soil and plant parts would be removed to prevent the spread of noxious weeds;
- After treatment, noxious weeds would be treated on all disturbed areas when detected.

2.3.8 Soil and Hydrology

- Should water sources appear following treatment, these water sources would be managed in accordance with multiple use management objectives and the Utah BLM Riparian Policy. Resulting riparian areas would be fenced if necessary;
- Mechanical treatments would occur when soils are moist, but not excessively wet or dry to reduce impacts to BSCs;
- Mechanical treatment using heavy equipment would not occur on slopes exceeding 30% (see Figure A6, Appendix A, Project Area Percent Slope).

2.3.9 Range

- Range improvements (fences, water developments, pipelines, corrals, cattle guards) would be identified and protected from treatment activities;
- Grazing non-use agreements would be signed prior to Project implementation;
- Treatment areas would be rested or fenced from livestock grazing for a minimum of two complete growing seasons and possibly longer until objectives are met. Any fences installed as part of Project implementation would follow BLM fencing guidelines (BLM 1989);
- Permittees would be notified in a timely manner of changes to active permits. Once Project vegetation objectives are met, BLM may authorize grazing according to Utah BLM's Fundamentals for Rangeland Health (43 CFR 4180) and Guidelines for Grazing Management (1997);
- To help reduce economic impacts to permittees, those allotments which are not divided into pastures would have the treatments completed in one phase in order to help reduce the overall period of time the allotment is rested. Where possible, those allotments which are divided into pastures would have one pasture treated each phase so untreated pastures remain available for use;
- Any adjustments in stocking levels or other modifications to the existing permits would require further NEPA analysis following expiration of permits and analyzed under the permit renewal process. The implementation of utilization guidelines would be incorporated into the terms and conditions of the grazing permits when they are renewed.

2.3.10 Cultural Resources

- Cultural resources would be managed in accordance with Section 106 of the NHPA and implementing regulations 36 CFR 800;
- Given the scope of this Project, compliance would be accomplished in phases (as described in 36 CFR 800.4(b)(2)). Once the annual Project area (phase) is defined and funds made available, a 100% pedestrian (Class III) inventory would be conducted to identify and evaluate cultural resources for eligibility to the National Register of Historic Places (NRHP). Sites identified and determined to be eligible for the NRHP through consultation with the State Historic Preservation Office (SHPO) would either be flagged and avoided, resulting in a determination of No Effect to cultural resources OR after consideration of each site, if it is possible to treat the site without compromising the integrity or the

characteristics which make the site eligible for the NRHP, a determination of No Adverse Effect would be made and the vegetation on site would be treated. In the event that potentially eligible historic properties are discovered during the course of treatment, work in the immediate vicinity of the discovery would cease. BLM archeologists would further evaluate the site, and in consultation with the SHPO, select the appropriate action;

- Should human remains or associated funerary objects subject to Native American Graves Protection and Repatriation Act (NAGPRA) be discovered during fieldwork, the BLM archaeologist would be immediately notified, and work would cease in the immediate area in compliance with NAGPRA.

2.3.11 Hazardous Materials and Use of Chemicals

- Use of chemicals to reduce shrub/tree cover would be used primarily as a maintenance tool to retain existing desirable vegetation on previously treated areas. However, this method could also be used on initial treatment when existing shrub or tree cover exceed 15% and perennial herbaceous cover is at least 10%;
- Noxious or invasive weeds discovered after treatment would be targeted for chemical treatment annually with BLM seasonal employees;
- All state and federal laws would apply to proper storage, application and disposal. Should an incident occur that creates hazardous waste, all applicable laws would be followed for reporting and remediation.

2.3.12 Air Quality

- Any prescribed burning would be done in compliance with the State Department of Environmental Quality and the Division of Air Quality Standards;
- The Utah Smoke Management Plan would be followed to mitigate for smoke and ash from prescribed fire.

2.4 Alternative B – No Action

Under the No Action Alternative, no acres would be treated. The area would remain as described in the current condition sections.

2.5 Alternatives Considered, but Eliminated from Further Action

Native Ecosystem Alternative

During the 30 day public review of the draft EA (November 2 through December 3, 2018), a NGO submitted an alternative they titled the "Native Ecosystem Alternative". The alternative lists 10 points to be analyzed or considered. After carefully reviewing the 10 points, it is clear that this is not an alternative to accomplish the stated purpose and need for the Project, rather this alternative seeks to change the purpose and need entirely. There is a difference of opinion on the potential vegetation within the area. It is clear when reading this alternative that this NGO considers the Project area in its entirety as a pinyon-juniper ecological site and therefore seeks to preserve pinyon-juniper in various ages, stand densities, and growth forms (points 1, 3). Because of this inherent flaw in considering the Project area as a pinyon-juniper ecological site, the alternative reads more as a research proposal than a viable alternative method of accomplishing the stated purpose and need. Many parts of this alternative (points 2, 4, 5, 6, 7, 8, 9) are not substantially different from what is already being proposed. Still other parts of this alternative seek to change the season of use, utilization criteria, rest periods and monitoring criteria of livestock grazing, which is outside the scope of this EA (point 10). The 10 points are summarized in Appendix F, along with the BLM response and rationale.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

3.1 Introduction

This chapter presents the potentially affected existing environment (i.e., the physical, biological, social, and economic values and resources) of the impact area as identified in the IDT Checklist found in Appendix C and discussed in Chapter 1 of this EA. It also contains the environmental effects of the alternatives to the resources identified as potentially impacted. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or are farther removed in distance but are still reasonably foreseeable. Cumulative effects are those impacts resulting from the incremental impact of an action when added to other past, present, or reasonably foreseeable actions regardless of what agency or person undertakes such other actions.

3.2 General Setting

For General Setting, refer to the Introduction in Section 1.1, where it is outlined in detail.

3.3 Resources/Issues Brought Forward for Analysis

The affected environment of the Proposed Action and No Action alternatives were considered and analyzed by an interdisciplinary team as documented in the Interdisciplinary Team Analysis Record Checklist, Appendix C. The checklist indicates which resources of concern are either not present in the Project area or would not be impacted to a degree that requires detailed analysis. Resources which could be impacted to a level requiring further analysis are described in this Chapter and impacts to these resources are analyzed in Section 3.4 (Direct and Indirect Impacts).

3.3.1 Soils and Biological Soil Crusts

Soils

Soil types and characteristics vary widely across the roughly 30,500 acres proposed for treatment. The majority of the individual soils are relatively deep (except where bedrock is exposed at the surface or just below it), and moderately to highly susceptible to degradation, primarily from wind and/or water erosion. See Table 4 for details on the dominant soil types in the areas proposed for treatments.

Table 4. Soil Characteristics and Ecological Sites in the Project Area

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres	BLM Site Degradation Susceptibility (Limiting Feature)	Depth to Bedrock (cm)
5181	Parkelei-Plumasano, moist-Pinepoint complex, 2 to 15 percent slopes	Parkelei (40%)	Upland Loam (Mountain Big Sagebrush)	15,358	Moderate to High (Wind Erosion)	>200
		Plumasano, moist (25%)	Upland Loam (Mountain Big Sagebrush)			
		Pinepoint (20%)	Upland Sand (Mountain Big Sagebrush)			
		Parkwash (10%)	Upland Shallow Sand (Pinyon-Utah Juniper)			
		Arabrab (5%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3			
5126	Pinepoint-Parkwash	Pinepoint (75%)	Upland Sand (Mountain Big Sagebrush)	5,672	High	>200

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres	BLM Site Degradation Susceptibility (Limiting Feature)	Depth to Bedrock (cm)
	complex, 2 to 15 percent slopes	Parkwash (15%)	Upland Shallow Sand (Pinyon-Utah Juniper)		(Wind Erosion, Restrictive Layer)	
		Rock outcrop, Navajo sandstone (7%)				
		Ustifluvents (3%)				
5120	Pinepoint-Flatnose complex, 2 to 8 percent slopes	Pinepoint (55%)	Upland Sand (Mountain Big Sagebrush)	2,187	High (Wind Erosion)	>200
		Flatnose (35%)	Loamy Bottom (Basin Big Sagebrush)			
		Parkwash (10%)	Upland Shallow Sand (Pinyon-Utah Juniper)			
5210	Elpedro, moist-Flatnose complex, 2 to 8 percent slopes	Elpedro, moist (65%)	Upland Loam (Mountain Big Sagebrush)	1,781	Slight to Moderate (Wind Erosion)	>200
		Flatnose (25%)	Loamy Bottom (Basin Big Sagebrush)			
		Brumley (5%)	Upland Loam (Mountain Big Sagebrush)			
		Plumasano, moist (4%)	Upland Loam (Mountain Big Sagebrush)			
		Hetz (1%)	Semiwet Fresh Meadow			
5182	Arabrab-Colskel-Rock outcrop, Carmel Formation, complex, 15 to 50 percent slopes	Arabrab (35%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3	1,574	High (Wind Erosion, Water Erosion, Restrictive Layer)	30
		Colskel (30%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3			
		rock outcrop, Carmel formation (20%)				
		Psamments (10%)				
		Brumley (5%)	Upland Loam (Mountain Big Sagebrush)			
5183	Parkwash-Rock outcrop, Navajo Sandstone-Vessilla complex, 30 to 65 percent slopes	Parkwash (30%)	Upland Shallow Sand (Pinyon-Utah Juniper)	1,083	High (Wind Erosion, Water Erosion, Restrictive Layer)	0
		rock outcrop, Navajo sandstone (30%)				
		Vessilla (30%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3			
		badland, Carmel formation (10%)				
5180	Pinepoint-Rock outcrop,	Pinepoint (40%)	Upland Sand (Mountain Big Sagebrush)	869	High	76

Map unit symbol	Map unit name	Component name (percent)	Ecological site	Acres	BLM Site Degradation Susceptibility (Limiting Feature)	Depth to Bedrock (cm)
	Navajo Sandstone-Parkwash complex, 15 to 50 percent slopes	rock outcrop, Navajo sandstone (30%)			(Wind Erosion, Water Erosion, Restrictive Layer)	
		Parkwash (20%)	Upland Shallow Sand (Pinyon-Utah Juniper)			
		Rock outcrop, Kayenta formation (5%)				
		Ustifluvents (5%)				
5200	Sojourn family-Retsabal-Colskel complex, 10 to 50 percent slopes	Sojourn (40%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3	809	Moderate to High (Wind Erosion, Water Erosion, Restrictive Layer)	>200
		Colskel (25%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3			
		Retsabal (25%)	Semidesert Shallow Gypsum (Mormontea)			
		Badland, Carmel formation (10%)				
5201	Sojourn family-Aridic Ustorthents complex, 15 to 50 percent slopes	Sojourn (60%)	Upland Shallow Loam (Pinyon-Utah Juniper) AWC <3	681	High (Wind Erosion, Water Erosion, Restrictive Layer)	>200
		Aridic Ustorthents (30%)	Upland Steep Stony Loam (Utah Juniper-Pinyon)			
		Badland, Carmel formation (10%)				
5151	Pinepoint, dry-Tenneycanyon-Parkwash complex, 2 to 25 percent slopes	Pinepoint, dry (50%)	Upland Sand (Utah Juniper-Pinyon)	390	High (Wind Erosion, Restrictive Layer)	>200
		Tenneycanyon (30%)	Upland Sand (Utah Juniper-Pinyon)			
		Parkwash (15%)	Upland Shallow Sand (Pinyon-Utah Juniper)			
		Rock outcrop, Kayenta formation (3%)				
		Rock outcrop, Navajo sandstone (2%)				
5004	Rock outcrop, Navajo Sandstone	Rock outcrop, Navajo sandstone (90%)		60	n/a	0
		Psamments (10%)				
59	Parkelei-Skutumpah-Royosa complex, 4 to 15 percent slopes	Parkelei (50%)	Upland Loam (Gambel Oak)	45	Moderate to High (Wind Erosion)	>200
		Royosa (20%)	Upland Sand (Mountain Big Sagebrush)			
		Skutumpah (20%)	Upland Loam (Mountain Big Sagebrush)			

Data from NRCS 2018.

Soil stability is the potential of an ecosystem to maintain its porous structure to allow for passage of air and water, withstand erosive forces and provide a medium for plant roots. Overall, long-term soil stability has been an issue in portions of the Project area, due to past management efforts and land uses. The dense tree cover has led to a lack of understory vegetation in much of the Project area has increased wind and water erosion, leading to reduced soil stability.

Soil productivity (long term) is the inherent potential of the ecosystem to maintain a certain level of vegetation and associated processes, such as water, wildlife, and clean air. Fixed components which influence soil productivity include local climate, topographic features, and soil type. Variable components affecting productivity include: bulk density and porosity, water, availability, organic matter, biology, and chemistry.

Processes known to cause the greatest adverse effects on soil physical, chemical, and biological properties associated with the types of proposed management activities are soil compaction, displacement, and erosion. Direct effects to the soils include compaction and displacement. Soil erosion and changes in soil biology usually occur as indirect effects.

Biological Soil Crusts

Biological Soil Crusts (BSC) play important ecological roles in soil stability, atmospheric nitrogen fixation, nutrient contribution to plants, soil-plant water relations, seedling germination, and plant growth. Biological soil crusts occur throughout the Project area; however, they are not pervasive. Biological soil crusts that do occur within the Project area may have been impacted by a variety of past disturbances including fire, grazing, trampling by foot or vehicle, and increased erosion. Disturbances that remove or kill BSC take longer to recover from than disturbances that leave crust material in place. Most of the past activities associated with disturbance within the Project area would likely have damaged rather than destroyed existing BSC communities, if and when such actions occurred.

Historic fire regimes in semi-arid and arid landscapes generally left small patches of burned and unburned areas, creating a mosaic of successional stages of vascular plants and BSCs. High intensity fire generally kills BSCs and/or results in a loss of BSC surface cover and species diversity (see Fire and Fuels section for a discussion of fire history and fire intensity) (Belnap et al. 2001).

3.3.2 Cultural Resources and Native American Religious Concerns

Previous investigations of the surrounding and immediate area indicate the presence of significant cultural resources within the proposed Project area. Cultural resources may be defined as prehistoric and historic districts, sites, buildings, structures, and objects that represent past human activities. Human occupation of the study area spans the last 13,000 years or more.

The cultural sequence represented potentially includes Paleo-Indian, Archaic, Anasazi, Paiute and historic European cultures. The semi-arid climate contributes to a remarkable degree of preservation of cultural material. These often-well-preserved sites and artifacts are valued not only by the scientific community, but also by Native American Tribes, private organizations, the local community, and interested parties worldwide for their scientific, religious, cultural, and recreational significance.

Natural processes, including erosion, fire, decay of organic material, and destruction by animals native to the area can result in adverse impacts to cultural resources. Over time, these natural processes have the potential to preserve, alter, or completely destroy an archaeological site. Human activities, intentional or not, can greatly alter the rate at which sites are impacted in both positive and negative ways. Intentional activities, such as vandalism, looting, or improper management of the local environment can increase the rate at which sites are destroyed. However, purposeful and scientifically sound management of surrounding resources can result in improved preservation of these non-renewable resources.

Native American groups still utilize the modern landscape for traditional purposes, such as visits to important locations for spiritual purposes and gathering of culturally important plants. Archaeological sites are generally viewed as "footprints" of the Native American ancestors, and as such, hold importance beyond what is usually considered for archaeological sites. Traditional Cultural Properties (TCPs) may not have aspects usually associated with archaeological sites, and input from the area's traditional tribes may be needed to identify TCPs and Sacred Sites.

The management of cultural resources on federal lands is mandated by a series of laws and regulations, including NEPA, NHPA, the Archaeological Resources Protection Act (ARPA), and the Native American Graves Protection and Repatriation Act (NAGPRA), among others. Prior to an undertaking, these laws require an investigation to identify and inventory cultural resources, evaluate their significance and assess potential impacts.

3.3.3 Air Quality

The Clean Air Act (CAA) and the subsequent CAA Amendments of 1990 authorize the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. The CAA established NAAQS for six common air pollutants, known as "criteria" pollutants because the ambient standards set for these pollutants satisfy "criteria" specified in the CAA.

These commonly found air pollutants are located all over the United States and include particulate matter (PM_{10} and $PM_{2.5}$), ground-level ozone (O_3), carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x), and lead (Pb). These pollutants can harm human health and the environment, or cause property damage (EPA 2018a). Air quality in the Project area is generally good, and Kane County is considered to be in "attainment" for the NAAQS (i.e., concentrations of criteria pollutants do not exceed the NAAQS; EPA 2018).

Class I areas, as defined in the CAA, are areas of special significance (such as certain national parks and federal wilderness areas) that have been identified for stringent protection from air pollution damage. The Project area is not located in or immediately adjacent to any Class I areas, although Zion National Park (approximately 25 miles to the west of the Project area), Bryce National Park (approximately 10 miles to the north-northeast), and Capitol Reef National Park (approximately 90 miles to the northeast) are all designated Class I areas.

3.3.4 Fish and Wildlife

Migratory Birds

Most birds in the Project area are considered neo-tropical migratory birds except for the upland game birds such as wild turkey and greater sage-grouse. Migratory birds are protected and managed under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 *et. seq.*) and Executive Order 13186. Under the MBTA, nests (nests with eggs or young) of migratory birds may not be harmed, nor may migratory birds be killed. Executive Order 13186 directs federal agencies to promote the conservation of migratory bird populations.

There are dozens of migratory bird species that utilize the different habitats associated with the proposed Project area for a portion of their lifecycle and may be present in the Project area. Some of these species are: ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes beweckii*), black-billed magpie (*Pica hudsonia*), black-throated gray warbler (*Dendroica nigrescens*), blue-gray gnatcatcher (*Olioptila caerulea*), bushtit (*Psaltriparus minimus*), Brewer's sparrow (*Spizella breweri*), gray flycatcher (*Empidonax wrightii*), gray vireo (*Vireo vicinior*), juniper titmouse (*Baeolophus ridgwayi*), loggerhead

shrike (*Lanius ludovicianus*), mountain chickadee (*Poecile gambeli*), pinyon jay (*Gymnorhinus cyanocephalus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), vesper sparrow (*Poocetes gramineus*), western bluebird (*Sialia mexicana*), and western scrub jay (*Aphelocoma californica*).

Of the priority habitats currently listed by Partners in Flight for the state of Utah, the analysis area may contain portions of the following priority habitats for migratory bird species, including but not limited to the following habitats and associated species:

- Pinyon-juniper – black-throated gray warbler, gray vireo, Virginia's warbler (*Oreothlypis virginiae*)
- Sagebrush-steppe – greater sage-grouse, sage sparrow
- Desert scrub – Brewer's sparrow, gray vireo, and sage sparrow

Special Status Species

Special status species include federally listed threatened/endangered/candidate species and Utah State sensitive species for these habitats. BLM policy is to provide these species with the same level of protection as provided for candidate species in BLM Manual 6840.06C, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed."

A search of all the known available data was conducted to determine which special status species may be present in the analysis area. Special status species that are known to occur or may occur in the analysis area include: bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos)*, greater sage-grouse, and northern goshawk (*Accipiter gentilis*). With the exception of golden eagle, these species use the Project area exclusively in winter months and are discussed further below:

Bald eagle was first protected under the Bald Eagle Protection Act of 1940, and then listed as an endangered species in most of the lower 48 states in 1966 and again in 1973. A ban on DDT and other persistent organochlorines, habitat protection, and other recovery efforts led to the recovery. In 1995, the USFWS reclassified the bald eagle under the ESA from endangered to threatened in the lower 48 states (*Federal Register* 50 CFR, part 17, vol. 60, no. 133). Finally, the bald eagle was removed from the list of threatened and endangered species by the USFWS in June 2007.

The bald eagle is found throughout Utah, more often during the winter than the summer. Feeding areas, diurnal perches, and night roosts are fundamental elements of bald eagle winter range. In Utah, eagles generally nest in mature cottonwoods. Fish and waterfowl are the primary sources of food for bald eagles, but they also will feed on rabbits, carrion, and small rodents. Threats to the species include loss of lowland riparian habitats, which serve as nest and roost habitat, as well as nest and roost abandonment which results from excessive human disturbance (UDWR 2005). Breeding and wintering habitat exists in Kane County (UDWR 2018c), and the Project area may provide small areas of wintering habitat in the occasional cottonwood trees along Johnson Wash and Skutumpah Canyon.

Golden Eagle are rarely observed near the Project area, although they are much more common during winter months when they congregate at lower elevations. Golden eagle nest on cliff edges and large rock outcrops, although none are known to nest within the Project area. They eat mainly rodents and jackrabbits but are also known to prey upon other bird species especially water fowl and sage-grouse. They are best suited to hunting open country where they use their keen eyesight to locate prey. They typically avoid heavily wooded areas such as the Project area due to the lack of prey species and also the inability to locate prey. Like the bald eagle, carrion is a large portion of their winter diet and they are often seen along roadsides where carrion is likely to be found.

Greater Sage-grouse (GRSG) is a sagebrush obligate species and is strictly associated with sagebrush/grasslands. GRSG may eat a variety of grasses, forbs, and insects during the breeding season but feed almost entirely on sagebrush during the winter months, selecting shrubs with high protein levels (Paige and Ritter 1999).

GRSG habitat in Utah is divided into 11 Sage-Grouse Management Areas (SGMAs). Upland portions of the Project area (roughly the northern half) lie within the Panguitch SGMA, which extends from the Project area north almost to the town of Beaver. Land within a SGMA is broken into sub-categories: 1) Sagebrush Focal Areas, 2) Priority Habitat Management Areas (PHMA), 3) General Habitat Management Areas, 4) Opportunity habitat, and 5) non-habitat. The Project area contains 5,841 acres of PHMA for GRSG (Figure A7, Appendix A). PHMA is defined as "BLM lands having the highest value to maintaining sustainable GRSG populations". The Project area also contains 17,788 acres of Opportunity habitat, which is defined as "portions of GRSG management areas that currently do not contribute to its life cycle but where restoration or rehabilitation can provide additional habitat when linked to existing GRSG populations" (ARMPA 2015).

The Project area is home to the southernmost population of GRSG within their range. GRSG sightings in the Project area are uncommon at present, but sightings consistently occur in the winter months. Currently no leks (male strutting areas), brood rearing habitat, or summer habitat exist in the Project area (UDWR 2018a). Historically, GRSG within the analysis area had a greater distribution than they currently do (UDWR 2002). Historical vegetative conditions where sagebrush steppe was maintained by fire were much more conducive to GRSG. As recently as the 1980's there were several GRSG leks near the Project area suggesting that nesting, brooding and summer habitat also existed nearby. Although difficult to understand all of the reasons for their decline, the current vegetative condition of the Project area has certainly contributed to the decline in population and the loss of leks and brood rearing habitat. The lack of natural disturbances such as low intensity wildfire, and grazing practices that favor tree growth have led to pinyon-juniper encroachment and large, even-aged stands of dense, decadent sagebrush which provides little value to GRSG (Frey, et. al. 2006). GRSG near the Project area are currently observed in habitats that are treeless, which coincides with areas that were previously treated in the 1960s or more recently on private lands. In the current vegetative condition, the majority of the Project area is opportunity habitat for GRSG; it is currently not suited for GRSG but could become suitable with modification.

Wildfire and loss of sagebrush steppe habitat due to pinyon-juniper expansion and infilling is identified as a major threat to GRSG in the Utah State Sage-Grouse Conservation Plan (UDWR 2013) and the Utah BLM Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA 2015). Thus, proactively managing pinyon-juniper to reduce fire threat and prevent loss of sagebrush steppe is considered to be a priority conservation measure to meet GRSG habitat objectives.

General Wildlife and Game Species

A variety of terrestrial wildlife resources in the proposed Project area are typical of the Colorado Plateau physiographic province. Mammalian species typical of the Project area include mule deer, elk, coyote (*Canis latrans*), jack rabbit (*Lepus* spp.), cottontail rabbit (*Sylvilagus* spp.) and several species of small mammals, most notably the sagebrush vole (*Lagurus curtatus*) and the whitetail antelope squirrel (*Ammospermophilus leucurus*).

Many different species of reptiles may be present in the proposed Project area. Common reptilian species include side-blotched lizard (*Uta stansburiana*), sagebrush lizard (*Sceloporus graciosus*), gophersnake (*Pituophis catenifer*), terrestrial gartersnake (*Thamnophis elegans*), and rattlesnake (*Crotalus* spp.). None of these reptilian species are considered "sensitive" by the BLM or the State of Utah.

Mule deer – The Project area is within the Paunsaugunt Deer Herd Unit. The current herd management plan has a goal of 5,200 wintering mule deer on the unit. That number could be increased to as high as 6,500 wintering deer if future range trend studies suggest a marked improvement. However, the reverse is also a possibility. If range condition continues to decrease, herd numbers may be further reduced. The most recent data suggests that 10 of the 13 UDWR winter range trend sites within the unit were rated as poor or very poor. One of the strategies identified in the current plan suggests the removal of pinyon-juniper encroaching onto sagebrush steppe habitat as a management action that would likely benefit the deer herd and improve range condition (Paunsaugunt Deer Herd Unit Management Plan, May 2015).

There are few resident mule deer within the Project area. However, the area is extremely important for mule deer during migration periods in the spring and fall and also during winter months. Mule deer migrate through the analysis area seasonally along elevation gradients. Areas without heavy snow accumulations that are accessible during the winter and considered essential to the life cycle requirements of mule deer are classified as "crucial winter habitat" by the UDWR. These areas are typically found below the White cliffs. 15,366 acres within the Project area fall into this category. Areas that may be accessible on dry winters or winters with little snow accumulation are also very important to deer and are classified as "substantial winter habitat". These areas are above the White cliffs but below the Paunsaugunt Plateau. 39,538 acres within the Project area fall into this category (UDWR 2018e). For seasonal deer maps refer to Figure A8, Appendix A.

Deer are generally classified as browsers, with shrubs and forbs making up the bulk of their annual diet, although their diet can be quite varied. The importance of various classes of forage plants varies by season. In winter, especially when grasses and forbs are covered with snow, their entire diet may consist of shrubby species. In spring and early summer, grasses and forbs become increasingly important to nursing does with fawns and bucks for antler growth.

Rocky Mountain elk – The assessment area is within the Paunsaugunt Elk Herd Unit (see Figure A9, Appendix A). The current herd management plan has a goal of 140 wintering elk on the unit. Growth potential for the elk herd within the unit is considered high. However, where this is a premium mule deer hunting unit, elk numbers will be kept low through hunting methods for the foreseeable future. Although somewhat rare, elk are occasionally spotted within the analysis area in low numbers. Elk can be found during any month of the year but are more prevalent in the Project area during the winter months when environmental conditions move them from the higher elevation forested habitats to the north. Like other members of the deer family, elk migrate seasonally to avoid heavy snows at higher elevations.

Elk are generally classified as both a grazer and a browser, with grasses and forbs making up the bulk of their summer diet. However, during harsh winters, elk consume large quantities of browse species. They tend to be found in areas of semi-open forest and forest edges next to parks and meadows. Elk habitat within the Project area has also suffered from pinyon-juniper encroachment. The Paunsaugunt Elk Management Plan discourages the encroachment of pinyon-juniper trees into sagebrush and other habitats. It also calls for opportunities to improve habitat through grazing practices, prescribed burning, and mechanical treatments to improve habitat where pinyon-juniper encroachment is occurring (Paunsaugunt Elk Management Plan, 2016).

Pronghorn Antelope – The assessment area is within the Paunsaugunt Pronghorn Herd Unit. Currently, there is no specific herd management plan for the unit, but it is expected a plan will be drafted in 2019. UDWR currently does not formally recognize the Project area as having habitat for pronghorn. The Project area has been so heavily dominated by pinyon-juniper in recent decades that pronghorn had ceased to be in the area. However, with the recent vegetation work that has occurred on non-Monument BLM land immediately north of the Project area (KFO), pronghorn have begun to reoccupy adjacent lands and have been observed in small numbers for the past several years.

The species is common in Utah, where it primarily occurs in desert, grassland, and sagebrush habitats. Pronghorn are often found in small groups and are usually most active during the day. Breeding occurs during the fall. Females typically give birth to two kids in the spring, although younger females may produce only one offspring. Pronghorn are browsers that primarily consume shrubs, such as sagebrush, and forbs although grasses are also consumed. Both males and females have true horns that are not shed, but pronghorn are peculiar in that they shed the sheaths off of their horns each year.

3.3.5 Fuels and Fire Management

Fire Management Plan

The Project area falls within three different Fire Management Units (FMUs) identified in the current Southern Utah Support Area (SUSA) Management Plan (FMP) (2005). They are the East Sands, Glendale Bench and Big Deer FMUs.

The East Sands FMU is managed under a full suppression strategy to protect a critical watershed for Kanab and adjacent subdivisions. The objectives for this unit call for prescribed fire and non-fire fuels Projects to convert 6,600 acres of juniper and 560 acres of pinyon-juniper to sagebrush/grass, 1,380 acres of sagebrush and 681 acres of sagebrush/perennial grass for age class diversity objectives. Prescribed fire and fuels treatments combine to 9,220 acres.

The Glendale Bench FMU is important for GRSG as it contains occupied habitat. The FMU plan calls for treatment of 22,000 acres as follows: Using natural fire, prescribed fire and mechanical treatments, convert 15,000 acres of pinyon-juniper to sagebrush/grass, convert 5,000 acres of juniper to sagebrush/grass, create a mosaic of age classes in the sagebrush and sagebrush/perennial grass vegetation types on 2,000 acres. Where ponderosa pine is an important component of this FMU, the plan seeks to improve ponderosa pine vigor and reproduction by using prescribed fire and/or non-fire fuels treatments.

The Big Deer FMU contains habitats deemed to be extremely important for GRSG and mule deer. It contains a majority of critical winter range and migration corridors for the Paunsaugunt deer herd. The FMU plan calls for treatment of 95,000 acres as follows: Convert 50,000 acres of pinyon and juniper woodland, 25,000 acres of juniper, and 20,000 acres of sagebrush to sagebrush/perennial grass using wildfire, prescribed, and non-fire fuels treatments.

Because of values at risk in these FMUs such as private property, municipal watersheds, communication facilities etc., full suppression tactics have generally been applied to naturally ignited fires within the units. Because of this, the fuels are currently at high levels and the current vegetative state does not resemble the natural historic state. The majority of the lands within these FMUs are currently in condition class 3 (see definition of condition class below as well as Appendix B). This has resulted in a large fuel load build-up and an alteration of fuel structure and composition. Pinyon-juniper trees once held in check by frequent fires, have expanded in range and moved into areas once dominated by shrubs, forbs and grasses. Pinyon-juniper expansion is well documented throughout the west, both through repeat photographs and peer-reviewed journals (see Appendix H Repeat Photography).

Fire Regime

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention but including the influence of aboriginal burning (Agee 1993, Brown 1995). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant over-story vegetation.

The Project area has three of the five fire regimes (see Figure A10, Appendix A). As noted in Table 5 below, the Project area historically saw fire on 98% of the area every 0-35 years. That is not to say that all acres within that area were burned or fully consumed. Some areas experienced stand replacing fire on less than 75% of the area while other areas had stand replacing fire on more than 75% of the area. However, with fire suppression and grazing strategies that reduced fine fuels needed to carry fire, only 560 acres or 1% of the Project area has burned in the past 34 years. The lack of fire in the Project area has led to a large buildup of shrubs and pinyon-juniper, which have affected the entire ecosystem.

Table 5. Historic Fire Regimes within Project Area (see Figure A10, Appendix A)

Historic Fire Regimes within Project Area	Percent of Project Area Historically in this Regime	Fire Regime Definition
FR1	14% of Project Area	0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced)
FR2	84% of Project Area	0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced)
FR5	0.6% of Project Area	200+ year frequency and high (stand replacement) severity
Barren	1.5%	N/A Barren

Condition Class

A fire condition class is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001). The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes.

The three classes are based on low (condition class 1), moderate (condition class 2), and high (condition class 3) departure from the central tendency of the natural (historical) regime (Hann and Bunnell 2001, Hardy et al. 2001, Schmidt et al. 2002). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside.

As depicted in Table 6 below, 93% of the Project area is in condition class 3 (lands that are significantly altered from their historical range), 5% is in condition class 2 (lands that have been moderately altered by either decreased or increased fire frequency), with the remainder being barren or agricultural lands, which are not classified in this system (see Figure A11, Appendix A).

Table 6. Current Fire Condition Classes within Project Area (see Figure A11, Appendix A)

Current Fire Condition Classes within Project Area	Percent of Project Area in Condition Class	Description	Potential Risks
CC1	0%	Within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) are low.
CC2	5.4%	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are moderately departed. Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate; Risk of loss of key ecosystem components is moderate.
CC3	93%	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.
Barren	1.5%	N/A Barren	N/A Barren

Fire Frequency

During the past 34 years, this area has experienced infrequent and small fires (due primarily to fire suppression efforts). There were approximately 32 recorded fire starts on BLM lands within the Project area between 1985 and 2019. Of these, only three fires burned over 25 acres (and the largest burned primarily outside of the Project area). All told, BLM records show approximately 560 acres within the Project area burned during this 34-year window.

Pinyon-juniper trees continue to expand in range and increase in density. Current closed tree canopy and material on the ground (ladder fuels) has increased the risk of catastrophic wildfire. Extreme fire behavior such as fire whorls, flame lengths in excess of 300 feet, and spotting distances in excess of ½ mile can be anticipated in dense canopy pinyon-juniper and sagebrush fuel types within the Project area.

3.3.6 Hydrologic Conditions, Water Resources/Quality, and Wetlands/Riparian Zones

Hydrologic Conditions

Precipitation falling to the land surface can be intercepted by vegetation, infiltrate into the soil, or run off the land as overland flow. Infiltration capacity tends to be higher in areas with gentle slopes, deep soil horizons, coarse soil textures, and high percentages of vegetation cover. When infiltration capacity is low water will run off. Areas of bare ground tend to have lower infiltration rates, because raindrop impacts cause the soil surface to 'seal'; compacted areas also tend to have low infiltration rates (Dunne and Leopold 1978). Topographic depressions and organic debris in contact with the soil surface can detain overland flow and cause runoff to infiltrate.

Like many areas within the GSENM, the proposed Project area is prone to overland flow generation (runoff) during high intensity summer thunderstorms. The combined effects of past land use, pinyon-juniper encroachment and recent drought have caused changes in plant community composition, reductions in vegetation and litter cover, development of connected patches of bare ground, and soil compaction. Within the Project area, there are roads, trails, cattle trails, and corrals; compaction of soils is probably localized to those areas and not dispersed over the Project area. Hydrologic conditions are largely related to the soils (shallow vs deep, sandy, steep vs flat etc.) and vegetation cover. Runoff generation is related to these characteristics and to the high intensity storms the area gets, where rainfall rate exceeds infiltration capacity by a significant amount. As a result, the rate of interception and infiltration of precipitation has generally been reduced, and the rate of surface runoff has generally increased within the Project area.

Water Resources/Quality

The Project area encompasses nearly 130 miles of intermittent and ephemeral streams and washes. Intermittent streams in the Project area include Johnson Wash (9.7 miles in length) and its major tributary Skutumpah Creek (3.6 miles), which are fed by springs and precipitation. The numerous smaller drainages throughout the Project area are ephemeral. As is typical for intermittent and ephemeral streams in the region, it is likely that, when flowing, streams in the area transport a relatively high load of sediment (clay, silt, and sand) as a mix of bedload and suspended load.

The proposed Project area is neither a source for drinking water nor a primary groundwater recharge area. The only water quality data from the Project area are from a catchment called Pink Cove, located at the base of the White Cliffs in the southeastern portion of the Project area. Results from sampling in 1998 and 2000 show slight exceedances of water quality standards for nongame aquatic life. Regionally, portions of Johnson Wash (including Skutumpah Creek) and Kanab Creek (a minor tributary of which lies in the northwestern portion of the Project area) are listed by the Utah Department of Environmental Quality as impaired streams for several water quality parameters including total dissolved solids, dissolved oxygen, benthic macroinvertebrate scores, and various metals (DWQ 2016).

Wetlands/Riparian Zones

The intermittent and ephemeral streams and washes in the Project area do not support substantial riparian zones. Riparian vegetation, when present, exists as scattered individuals or small stands of Fremont cottonwood (*Populus fremontii*) and shrubs or small trees such as willows (*Salix* spp.), tamarisk (*Tamarix* spp.), and Russian olive (*Elaeagnus angustifolia*). A handful of springs and seeps are found across the Project area. The Ford Well, First Point, Old Corral, Cottonwood, and Timber Mountain Springs have enough flow to support small communities of wetland vegetation, which in some cases extend up to a few hundred feet downstream. Most are fenced off from cattle, but elk occasionally use them for wallows.

3.3.7 Rangeland Health and Livestock Grazing

Rangeland Health

There has been an overall reduction in the production and vigor of native and non-native perennial, cool-season grasses and native shrub communities on sites within the proposed treatment areas. On some sites, warm-season grasses such as galleta (*Hilaria jamesii*) occur at high densities where cool-season grasses such as Indian ricegrass (*Acnatherum hymenoides*) have been displaced. Many of the existing perennial, cool-season grasses occur beneath the canopy of shrub species. Undesirable, non-native annuals such as cheatgrass and tumbleweed are present and shrub communities dominated by big sagebrush (*Artemisia tridentata*) have declined in both density and plant vigor. Many of the sagebrush communities are comprised of older, even-aged, decadent plants which have low vigor and poor nutritional value for browsers. Grazing and browsing from both livestock and wildlife, encroachment of pinyon-juniper woodlands and drought-related impacts have reduced overall health, vigor, recruitment and production of a variety of grasses and shrubs.

Many former sagebrush steppe sites within the proposed treatment area are dominated by pinyon-juniper woodlands. The encroachment of pinyon-juniper woodlands limits the site potential for the recruitment and establishment of native grasses and shrubs. Native grasses and shrubs are not capable of competing with pinyon and juniper trees for sunlight, nutrients and water, resulting in the long-term loss of understory species which are important for grazing, browsing and soil stability.

The last intensive rangeland health inventory and assessments where determinations were made, were conducted in 2002 and 2003. Of the 25 sites evaluated for which determinations were made, seven of the sites either failed or were functioning at risk (FAR, Figure A12, Appendix A, Rangeland Health Upland Sites). Some inventory and assessment work was conducted again in 2012 but no final determinations were rendered as a result of that effort.

As data from the 2002-2003 determinations show (see Table 7 below), many sites note “water flow patterns”, “rills”, “gullies”, and “soil-movement” as departed from reference sites. Other data note “cover amount”, “cover distribution”, “community structure”, “community diversity”, “productivity”, “noxious and invasive plants”, “seed production”, or “recruitment” as departed from reference conditions. One data sheet concludes “at risk due to dense and increasing PJ (pinyon-juniper) cover crowding out understory-site--won’t change unless trees are thinned”. Another concludes “woodland stand and understory holding site together at present but understory in jeopardy from increasing PJ”. It is expected that current conditions have either not changed or have gotten even worse since no vegetation management attempting to rectify the situation has taken place since that time.

Table 7. Rangeland Health Determinations

Allotment or Pasture	Year	RLH Site ID#	SWA/ Soil Unit	1 Physical	2 Biotic
Johnson Canyon-Mark Point	2002	228	E521	Functioning, but departed in 3(Flow Patterns), 7(Rills)	FAR, departed in 4(Productivity), 2(Community Structure), 1(Community Diversity).
Johnson Canyon-Johnson Point	2002	229	E571	Functioning but indicator 8(Gullies) was departed.	Functioning but indicators 1(Community Diversity), 2(Community Structure), 4(Productivity), 5(Photosynthesis Activity), 3(Noxious & Invasive plants) were departed.

Allotment or Pasture	Year	RLH Site ID#	SWA/ Soil Unit	1 Physical	2 Biotic
Johnson Canyon-Swapp Canyon	2002	230	E571	Functioning but indicator 8(Gullies) was departed.	Marginally Functioning but indicators 4(Productivity), 6(Plant Status), 7(Seed Production), 1(Community Diversity), 2(Community Structure), 3(Noxious & Invasive Plants), 8(Recruitment) were departed.
Second Point	2002	249	L572	Functioning but Indicators 3(flow patterns) and 8(Gullies) were departed.	FAR due to 3(Noxious & Invasive Plants), 8 (Recruitment), 1 (community diversity) and 6 (Plant Status) being departed.
School Secti on	2002	254	S571	Functioning	Marginally Functioning but indicators 5(Photosynthesis Activity), 8(Recruitment), 1(Community diversity), 2(Community Structure), 3(Noxious & Invasive Plants), 4(Productivity) were departed.
School Section	2002	255	M552	Functioning	Functioning
Second Point	2002	257	S163	Pass	Pass
Pine Point-Cutler Point	2003	421	M521	FAR due to 2(Soil Movement-water), 3(Flow patterns), 9(Cover-amount), 10(Cover-distribution). Noted on the data sheet, "Woodland stand and understory holding site together at present but understory in jeopardy from increasing PJ".	FAR due to 6(Plant status), 7(Seed Production), 8(Recruitment), 1(Community Diversity), 2(Community Structure). Noted on the data sheet, "At risk due to dense and increasing PJ cover crowding out understory-site won't change unless trees are thinned".
Johnson Canyon	2003	1563	M552	Moderate departure in soil stability.	Slight to moderate departure.
School Section	2012		5120	Functioning. In 2012 RLH was read and passed but there has been no new determination since the 2002 data was collected.	Functioning

Livestock Grazing

Allotments/Seasons of Use

14 BLM administered grazing allotments occur within or overlap the Project area (see Table 8 and Figure A13, Appendix A, Project Area Grazing Allotments).

Table 8. Grazing allotments, season of use and number of AUMs for the Skutumpah Terrace Sagebrush Steppe Enhancement Project.

Allotment Name	Acres	Season of Use	AUMs
Black Rock	10,601	6/6-10/16	478
Boot	2,945	8/1-10/31	45
First Point	3,007	6/1-12/31	401
Ford Well	9,088	6/10-10/9	291
Granary Ranch	1,993	7/1-11/30	70
Johnson Canyon	12,416	6/1-11/15	274
Johnson Lakes	24,717	6/1-11/30	347
Locke Ridge	5,056	12/1-4/30	173
Meadow Canyon	4,763	9/1-11/30	144
Pine Point	9,682	6/16-10/15	365
School Section	753	5/1-6/30	102
Second Point	5,258	6/1-9/30	69
Timber Mountain	7,742	6/16-10/15	426
Vermilion	43,640	2/16-5/15; 6/1-9/15; 10/1-1/15	2,849

All of these allotments are for cattle use. There is a total of 6,034 AUMs that the GSENM and KFO manage in and adjacent to the Project area. In most allotments, the GSENM and KFO have established photo points and nested frequency plots, which are read every five years.

3.3.8 Recreation

The Project area is not a high-use recreational destination and is not managed as a special emphasis area with specific objectives for management of recreational uses. This area contains no developed recreational facilities but does include approximately 40 miles of designated open roads that are frequently used for recreational purposes. These uses and opportunities include dispersed activities such as hunting, camping, OHV driving, photography, and nature study. Recreational usage within the Project area is difficult to quantify due to the multiple points of ingress and egress. However, automated traffic counters show that approximately 8,000 vehicles per year travel the Nephi Pasture road along the southern boundary of the Project area; and that approximately 30,000 vehicles travel the section of the Skutumpah Road along the northern boundary of the Project area.

The Project area contains at least 45 undeveloped but established dispersed campsites, as documented by backcountry impact monitoring reports. These reports do not represent a comprehensive inventory of campsites but indicate areas of known and continual use by recreationalists. Campsites are predominantly along popular travel corridors, such as the Nephi Pasture, Cutler Point, and Skutumpah Roads.

Observations by BLM recreation staff indicate these campsites are used most in the fall months, during hunting season for the Paunsaugunt hunt unit and again in the spring by shed-antler gatherers.
There are currently 24 guide companies authorized to conduct commercial recreational services within the Project Area. Of these, 20 organizations are authorized for guided hunting; three for sightseeing and OHV driving; and one for wilderness therapy and associated camping services. These guide companies submit annual post-use reports documenting the areas wherein they conduct recreational services, but it is not feasible to cleanly distinguish what proportion of activities occur specifically within the Project area.

Based on these post-use reports and other monitoring efforts, though, it is the BLM's estimate that at least six to eight authorized wilderness therapy groups, each composed of eight to 12 persons, operates within the Project area for approximately three months each year. These long-term recreational activities occur continuously during day and night-time hours, and include hiking, backpacking, and multi-day base camping at previously disturbed locations along roads. Additionally, it is estimated that approximately five hunting guides conduct separate guided trips within the Project area each year. Activities include dispersed hunting throughout the Paunsaugunt hunt unit and camping at pre-existing locations, with each trip consisting of up to five days and with a typical group size of four total persons.

3.3.9 Lands with Wilderness Character (LWC)

There are no designated Wilderness Areas or Wilderness Study Areas in or adjacent to the Project area, however, the Upper Kanab Creek LWC unit extends into a small portion of the Project area and possesses wilderness characteristics (BLM 1999). The Upper Kanab Creek unit is characterized by exceptionally scenic white cliffs which separate uplands and lower slopes covered with juniper, pinyon pine, scrub oak, and a variety of other shrubs, forbs and cacti. The unit has mostly retained its natural character and provides outstanding opportunities for solitude or primitive and unconfined recreation, along with supplemental values such as roadside scenery and important geologic features. Approximately 5,120 acres of the roughly 46,000-acre unit lie within the Project area and are concentrated primarily on ridges. However, only 1,887 acres (4%) are affected by the Proposed Action as they would receive a pinyon-juniper removal treatment (refer to Figure A14, Appendix A, Lands with Wilderness Character). No management decisions have been made regarding the Upper Kanab Creek LWC unit within the Monument. Whether or not to manage these lands for LWC has yet to be determined by a LUP.

3.3.10 Woodland/Forestry

Woodland and forest cover types were analyzed using LandFire for the 55,047-acre Project area. Pinyon-juniper woodlands and shrublands cover nearly 70% of the Project area, with sagebrush habitats occupying an additional 12%. Current vegetation is highly departed from normal conditions. For detailed vegetation data, refer to section 2.1.2 Existing Vegetation.

Pinyon-juniper expansion into areas historically dominated by sagebrush and perennial grasses is well documented (Brockway et al. 2002) (West et al. 1998). Pinyon and Juniper are by far the most pervasive and dominant plant species within the Project area. Due to the historic fire return interval on most of the area (0-35 years), many of the trees are likely post-settlement (<150 years). Pre-settlement trees (>150 years) may also be found within the Project area in rocky outcrops, shallow soils, and slopes in excess of 30%. Only .6% of the Project area is in FRCC 5 with a fire return interval of 200+ years. Because of historic fire regimes, old-growth trees are not known to occur within the Project area and likelihood is low.

Long-term fire suppression efforts, coupled with excessive browsing and grazing by wildlife and livestock have also led to the conversion of sagebrush-steppe communities to large shrubland areas, dominated by homogenous stands of mature sagebrush, with declining, remnant populations of native perennial forbs and grasses. Understory shrubs, forbs, and grasses are often lacking, which may cause excessive surface runoff and soil erosion, reduced soil moisture and decreased groundwater recharge (Bedell et al. 1993) (Thurow

and Hester 1997). Reduced soil moisture and competition of woody species for light and moisture has resulted in reduced forage for both wildlife and livestock. Critical winter habitat and structural plant diversity, needed by mule deer and other wildlife, continues to be lost (Thurow and Hester 1997).

Vegetation cover types are dynamic over time. Disturbance regimes and use patterns influence distribution and health of cover types. Woodland cover types in the Project area in particular have changed dramatically since European settlement. In 1979, it was estimated that pinyon-juniper woodlands covered over 18 million acres within the United States, which represented an increase in area and density over the previous century (Tausch et al. 1981). Twenty years later, estimates were that pinyon-juniper woodlands covered over 74.1 million acres (West 1999), representing an increase of 400 percent in a twenty-year period. The Utah Forest Health Report (Keyes et al. 2003.) placed increases at closer to 300 percent, from populations prior to European settlement, with most of the expansion occurring in areas where sagebrush-grass and lower elevation plant communities dominated. We estimate the actual percent increase of pinyon-juniper in the Project area at over 200%.

Ponderosa pine is very limited in the Project area, forming few identifiable stands. Understory pinyon-juniper currently form ladder fuels that could potential spread ground fires into the crowns of remaining ponderosa pine and further reduce their presence on the landscape.

3.3.11 Vegetation and Invasive Species

Plant Species Composition

Big sagebrush dominates on approximately 6,000 acres within the Project area, which is much less than expected under healthy natural conditions (see Existing Vegetation in Chapter 2). Sagebrush skeletons within the pinyon-juniper dominated landscape indicate that sagebrush was much more pervasive in past decades but has succumbed to tree encroachment.

Native perennial grasses in the Project area include species such as Indian ricegrass, needle and thread (*Hesperostipa comata*), bottlebrush squirreltail (*Elymus elymoides*), muttongrass (*Poa fendleriana*), sand dropseed (*Sporobolus cryptandrus*), blue grama (*Bouteloua gracilis*), and galleta. Non-native perennial grasses present in past treatment areas include species such as crested wheatgrass (*Agropyron cristatum*), which has been seeded in rangelands across the West for forage. Undesirable non-native annuals such as cheatgrass occur primarily in disturbed areas. Native shrubs include big sagebrush, black sagebrush (*Artemisia nova*), Gambel oak (*Quercus gambelli*), antelope bitterbrush (*Purshia tridentata*), Utah serviceberry (*Amelanchier utahensis*), green rabbitbrush (*Chrysothamnus viscidiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), and broom snakeweed (*Gutierrezia sarothrae*). The primary tree species are pinyon pine, Utah juniper, and in limited amounts, ponderosa pine.

There has been an overall reduction in the production and vigor of native and non-native perennial, cool-season grasses and native shrub communities on sites within the proposed treatment areas. On some sites, warm-season grasses such as gramas occur at high densities where cool-season grasses such as Indian ricegrass have been displaced. Many of the existing perennial, cool-season grasses occur beneath the canopy of shrub species. Undesirable non-native annuals such as cheatgrass are present, but typically do not dominate the landscape. Much of the sagebrush community is comprised of older, even-aged, decadent plants which have low vigor and poor nutritional value for browsers.

Sensitive Species

Special status species include federally listed threatened/endangered/candidate species and Utah State sensitive species for these habitats. BLM policy is to provide these species with the same level of protection as provided for candidate species in BLM Manual 6840, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed."

There are three known BLM Utah sensitive plant species that may occur in the Project area. They include escarpment milkvetch (*Astragalus striatiflorus*), Conquist's phacelia (*Phacelia conquistiana*) and Atwood's pretty phacelia (*Phacelia pulchella* var. *atwoodii*).

Escarpment milkvetch is a short (up to 6 cm) perennial plant in the pea family that is found only in Kane and eastern Washington Counties in Utah, and adjacent portions of Coconino County, Arizona. It lives in sandy areas in interdune valleys, sandy depressions on ledges, and bars and terraces along streams, from 4,900 to 6,600 feet in elevation. It flowers from May to June, and produces inflated, mottled, hairy pods 12-18 mm long.

Cronquist's phacelia is a slender annual plant in the waterleaf family reaching 6-9 cm tall, and found only in western Kane County, Utah, and Mohave County, Arizona. Found on clay outcrops in pinyon-juniper-sagebrush and ponderosa pine communities from 5,700 to 6,900 feet in elevation, it produces tiny (3.5-4 mm long) pale purple flowers from May-June.

Atwood's pretty phacelia is another slender annual, though taller than Cronquist's phacelia at 5 to 20 cm, found only in western Kane County, Utah. Living in duff under junipers on soils derived from the Moenkopi and Carmel formations, it occurs in pinyon-juniper, oak, sagebrush, single-leaf ash, and serviceberry communities from 5,100 to 5,500 feet in elevation. The plant blooms from April-May, with 7-9 mm long, relatively showy flowers with purple petals and a yellow floral tube.

Invasive Species

As with many areas in and around the GSENM, various invasive plant species occur in the Project area. Some species, such as cheatgrass, are widespread across the landscape, although as mentioned above they do not typically dominate the vegetation cover in any given area. Others, such as Scotch thistle (*Onopordum acanthium*), occur in scattered pockets in disturbed areas where the populations may be quite dense at times. Tamarisk and Russian olive occur as individuals and small stands in the major drainages. Invasive species control efforts have been conducted at several sites across the Project area, primarily targeting Scotch thistle with herbicide treatments.

3.3.12 Visual Resources

Visual Resource Management System

The BLM uses the Visual Resource Management (VRM) system to inventory and manage visual resources on the lands it administers. The primary objective of the system is to minimize visual impacts of proposed Projects and activities on public lands. It uses four classes to describe the degrees of modification allowed within a given landscape, based upon a landscape's scenic quality, viewer sensitivity to that landscape, and comprehensive management objectives. The basic philosophy underlying the VRM system is that the degree to which a proposed Project or activity affects the visual quality of a landscape depends on the visual contrast created between the proposal and existing landscape.

Visual Resource Inventory (VRI)

The Project Area falls almost equally within portions of two Scenic Quality Rating Units (SQRU):

- *SQRU001- Skutumpah Terrace* – moderate scenic quality rating (high B with score of 17) on the upper end of the scale (range 11.5-18). This unit is comprised of a broad series of terraces that make the "riser" between the base of the Pink Cliffs and the top of the White Cliffs of the Grand Staircase. Vegetation is mostly pinyon-juniper forests and sagebrush/mixed shrub flats. Few modifications exist.
- *SQRU002 - White Cliffs* – high scenic quality (A with a score of 21.5). This unit is comprised of the Grand Staircase "riser" known as the White Cliffs extending south toward the Vermilion Cliffs, with

rolling hills, sand dunes and flats are cut through with gorges and canyons. The predominant vegetation is pinyon-juniper and sagebrush. Few modifications exist.

The Project Area falls within portions of three Sensitivity Level Rating Units (SLRU) disproportionately:

- *SLRU001* – unit along Johnson Canyon and Skutumpah Roads where maintenance of scenic quality is highly valued. Casual observers are primarily local and regional publics utilizing unit for recreation, commuting, and permitted uses; broader publics frequent destinations (Willis Creek, Bull Valley Gorge). Visual quality is valued but most users are accepting of modest visual change. Unit has higher sensitivity along Johnson Canyon (in Project Area) and between Lick Wash and Willis Creek (north of Project Area) than the remainder of the unit. Existing visual modifications (low-density residential development, vegetation treatments) influence public tolerance to change.
- *SLRU002* – unit associated benches and terraces extending from below the White Cliffs to the Vermilion Cliffs where maintenance of scenic quality is highly valued. Casual observers are primarily local and regional publics utilizing unit for recreation and livestock grazing. Unit provides motorized and non-motorized exploration; this, along with the density of cultural sites within the unit, contributes to its high sensitivity.
- *SLRU003* – associated with benches and terraces above the White Cliffs. Maintenance of scenic quality is moderately valued. Casual observers are primarily local and regional publics utilizing unit for recreation, hunting, and livestock grazing but specific destinations north of Project Area (Lick Wash, Bull Valley Gorge) are valued by the broader public. This unit is within the viewsheds of Bryce Canyon National Park and the Johnson Canyon/Alton Amphitheater State Scenic Backway, increasing the sensitivity to visual change.

The Project Area contains areas that inventoried in all three distance zones based on viewing platforms along Johnson Canyon and Skutumpah Roads. About 50% of the area is within the Foreground/Middle Ground Zone with visibility out to five miles; more than 30% is in the Seldom Seen Zone (hidden from view or beyond the Background Zone); and the remainder is within the Background Zone and visible out to 15 miles.

Combining the above inventory factors per BLM VRM policy, the Project Area inventoried as Visual Resource Inventory Classes II, III, and IV as shown in Figure A15, Appendix A, Project Area Visual Resources.

VRM Objectives

Almost 89% of the Project Area is VRM Class II (48,866 acres); the remaining acreage is classified as VRM Class III (6,168 acres). The VRM Classes each have an objective that prescribes the amount of change allowed in the characteristic landscape, as described below:

Class II: The objective for VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III: The objective for VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Any changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Visual Landscape Character

As viewed along Glendale Bench, Skutumpah and Johnson Canyon Roads, the Project area consists of both rolling terrain and canyon bottoms within enclosed landscapes. Foreground views are primarily composed of broad valleys covered with pinyon-juniper and oak woodlands, desert shrubs/grasses along Glendale Bench and Skutumpah Roads but more narrow canyon bottoms along Johnson Canyon Road.

Thick stands of mostly pinyon and juniper trees grow in much of the Project area. Along Skutumpah Road trees foreshorten the view to the immediate foreground on the south side. This is contrasted on the north side of the road with open views to the middle ground, background and beyond because the area was cleared of trees in the past few years. Along Glendale Bench Road most of the Project Area boundary has been treated to remove pinyon-juniper in the last 15 years so views extend beyond the foreground. Along Johnson Canyon Road, the Project treatment areas fall within the canyon bottom and side slopes below the white sandstone cliffs where views are of the foreground due to topography.

The predominant colors of this landscape are greens, tans, buffs, and grays. The greens run the spectrum of sage to dark green because of the vegetation. The tans and buffs are lighter and darker variations depending on the soil type and exposed stone outcrops. The grays are the predominant undertone of all other colors in the landscape. The textures of this landscape range from fine to coarse depending on variations in landform and vegetation depending on the location. There are very few built environment elements within this landscape, but of those that do occur, the roadways are the most obvious and add linear banding to the landscape. Other elements include fences, ponds and signs. The Project Area is a combination of classic sandstone canyons, pinyon-juniper woodlands and mixed shrubland landscapes in Southern Utah. See Figures 8-11 below.

Figure 8. View along Skutumpah Road looking west where pinyon-juniper would be reduced on south (left) side of road.

Figure 9. Along Skutumpah Road looking south where sagebrush would be treated.

Figure 10. Along Cutler Point Road looking north where pinyon-juniper would be reduced.

Figure 11. Along Johnson Canyon Road looking north where pinyon-juniper would be reduced.

The Project Area is used primarily by local commuters, recreationists (SRP-holders [wilderness therapy groups], hunters, OHV riders and equestrians), and cattle permittees. Those using the area for recreation are typically engaged in hunting, backpacking, sight-seeing, OHV activities, and photography. This range of individuals defines the casual observer. The most prevalent season of use is spring through fall.

3.4 Direct and Indirect Impacts

3.4.1 Soils and Biological Soil Crusts

Alternative A- Proposed Action

In the short term, direct effects to the soils and BSC include compaction and displacement from treatment activities, along with some increased erosion from soil disturbance. Mulching and hand-thinning leave woody debris and organic mulch in place which may help to mitigate short term impacts in those areas. In the longer term, soil stability and resistance to erosion would be expected to improve as vegetation establishes. Many of the soil types found within the Project area would, and likely did, support a wider community of grasses and forbs, with pinyon and juniper as a smaller component of the vegetation community. Removal of pinyon and juniper, enhancement of sagebrush shrublands and maintenance of existing treatments would allow perennial grasses and forbs to return to the site, adding stability to the soil and reducing upland erosion, and promoting a gradual increase in BSC cover.

Alternative B- No Action

There would be no direct increase in detrimental soil conditions that would negatively affect the soil and BSC if this alternative was implemented. There would be no removal of pinyon and juniper trees and therefore, no soil compaction or erosion attributed to treatment methods. Existing conditions and trends for soils would continue, with the ongoing increase in pinyon and juniper tree encroachment, loss of perennial understory species, and gradual degradation of soils and BSC across the Project area. By not implementing the Project, the risk of catastrophic fire would remain high in the Project area. Catastrophic fire would destroy any existing BSC in the area, which could reduce site stability and allow for a monoculture of invasive species such as cheatgrass.

3.4.2 Cultural Resources and Native American Religious Concerns

Alternative A- Proposed Action

Archaeological sites identified during the Class III inventory and determined to be eligible for the NRHP would be flagged and avoided, thus having No Effect. However, if it is found that conducting the vegetation treatment on site would have no impact on the integrity or the characteristics that make the site eligible for the NRHP, the treatment would be conducted on site resulting in No Adverse Effect as a result of the Proposed Action. Similar reasoning would apply to Traditional Cultural Properties (TCPs) and Sacred Sites, should any be identified. Final treatment of the Project area should include making protected site area vegetation match the surrounding terrain so as not to draw unwarranted attention to the sites.

Alternative B- No Action

The No Action alternative would not result in direct impacts to identified archaeological resources, because no physical disturbance would occur, thus resulting in No Effect to cultural resources and Native American religious concerns. However, over time, this alternative could contribute to indirect impacts on identified archaeological resources due to increased erosion, exposure, etc., should a fire occur.

3.4.3 Air Quality

Alternative A- Proposed Action

In the short term, emissions of airborne dust would temporarily increase as a result of ground-disturbing activities in the proposed Project area, along with negligible increases in engine emissions from vehicles and equipment used in treatments. Prescribed burning would also generate smoke emissions, which would impact local air quality and visibility. Best management practices would be used to minimize these short-term effects, including compliance with all burn requirements from the State Department of Environmental Quality and the Utah Smoke Management Plan. In the longer term, emissions of airborne dust would be expected to decrease, as the soil is stabilized by increased cover of perennial grasses and forbs with the proposed treatments. Smoke and other emissions would be reduced due to less frequent and intense wildfires.

Alternative B- No Action

There would be no direct impacts to air quality as a result of the No Action alternative as Project work would not take place. Indirectly, the immediate area could see a gradual increase in airborne dust emissions with increased erosion as understory vegetation is lost over time. Because heavy fuel loads within the Project area would not be reduced, air quality could be dramatically altered in a negative way in the event of a large wildfire event. Wildfires tend to burn hotter, consume more acreage, and produce much more pollution in areas with heavy fuel loads. Smoke from wildfires has been shown to produce far more fine particulate matter than automobiles or other greenhouse gas contributors. In 2017, after the worst wildfire season in Montana's history, air quality monitors picked up the highest levels of air pollution ever recorded

in the United States during August and September. These pollutants are detrimental to human health (Waldman, 2018).

3.4.4 Fish and Wildlife

Alternative A- Proposed Action

Migratory Birds

Project implementation would be scheduled to occur outside of the peak migratory bird nesting season to prevent the potential for direct impacts to breeding migratory birds. The Proposed Action's surface disturbing activities may, however, cause temporary habitat alteration, fragmentation, and/or loss depending on the type, amount, and location of activity and the needs of particular species. In the longer term, indirect impacts may be associated with changes in vegetation as a result of treatment practices, which could lead to loss of nesting, roosting, or foraging habitat for birds that utilize pinyon-juniper woodlands primarily. As most birds are highly mobile and the Project area comprises a small fraction of the greater Kanab watershed, any direct or indirect adverse impacts would be expected to be minimal. Additionally, at any given point in time over the life of the Project, only a small portion of the Project area would be in some level of treatment. This would limit potential impacts to the localized individual level, not to the species population as a whole.

The Proposed Action would aid in maintenance of or lead to improvement of sagebrush steppe vegetation, which over the long term would improve habitat for a wide variety of migratory birds that depend on this vegetation type. The Proposed Action would help ensure that enough residual vegetation remains to provide adequate cover requirements over the life of the Project to meet the needs of nesting birds.

Special Status Species

The Proposed Action would have some direct impacts to bald eagle, golden eagle, and northern goshawk because these Projects are typically implemented between October and April when these species are most likely to be in the area. Impacts could come from removal of perches, noise disturbance or increased traffic in areas targeted for treatment annually. Because this is a phased Project, these impacts would only occur on a small percentage of the Project area in any given year. The impacts would be temporary and of relatively short duration.

Indirectly, bald and golden eagle would see an overall species benefit over the long term. Both of these species prey heavily on rodents and rabbits which are expected to see an increase after implementation. Other positive impacts to foraging habitat for the bald and golden eagle would result from an increase in open, sagebrush steppe vegetation. The northern goshawk would see little or no benefit from the Proposed Action as they are more likely to be found in forested habitats than open sagebrush steppe habitats. Wintering habitat for northern goshawk would be reduced but it's not expected that the reduction would result in any noticeable population impacts.

The Project is being proposed, in large part, to restore sagebrush steppe habitat for GRSG. Occupied GRSG habitat areas will not be treated during their wintering season (Nov. 15 to March 15) and therefore there will be no direct impacts to GRSG. Indirectly, GRSG should see nearly immediate benefits due to the Project. Results from a previous study on vegetation treatments directly adjacent to the Project area found that female grouse selected for treated areas or habitat adjacent to treated areas throughout the year (Boswell, 2017). Additionally, past treatments to remove woody vegetation and reduce sagebrush stand density adjacent to this proposed Project resulted in increased use of the treated area year round, including the winter months, by both sexes (Frey, unpublished data, Boswell, 2017). In particular, females tended to select for habitats adjacent to treatments in winter, as well as nesting and brood rearing seasons, a result that is supported by studies in other areas (Sanford et al, 2017; Severson, 2017).

Both sexes selected for areas away from pinyons and junipers. Knowing the ecological site potential and using similar methods we have a high likelihood of creating habitat that is similar to that habitat where GRSG are currently observed in the area, and we increase the opportunity for GRSG to use this habitat within a year or two of its creation. In the long term, the proposed treatments should result in positive impacts to GRSG as areas currently dominated by pinyon-juniper or sagebrush monocultures are converted to a mix of perennial grasses, forbs, and shrubs. While GRSG are uncommonly seen in the Project area at present, almost half of the Project area has been identified as current or opportunity habitat.

Because GRSG used the area in the past, restoring the area to conditions recorded during their use should result in an increase in numbers and expanded range for the local population. Furthermore, telemetry data collected over 10-years suggests that GRSG mortality has declined since the initiation of vegetation treatments, possibly as a result of increased suitable habitat distribution (Frey, personal communication, 2018). It is possible that GRSG could re-initiate lekking, breeding and brood rearing within the Project area as vegetation is moved to a more favorable and natural condition, just as they did historically.

Maintaining the resiliency of this landscape, while creating a mosaic of potential habitat for GRSG to adapt to changing conditions has been identified by the local sage-grouse working group and the UDWR as critical for their long-term survival. While we cannot predict exactly how GRSG will use this habitat, creating conditions that are known to be selected by GRSG during different life stages (winter habitat, breeding, brood rearing) or during extreme weather events (food availability during winter storms, moist green vegetation during hot, dry summers) will serve to provide GRSG with options for their increased and continued use of the Project area (Brooks and Chambers, 2011; Chambers et al., 2013, Adler et al. 2018).

General Wildlife

The small proportion of the Project area treated in any given year would result in temporary displacement of wildlife that uses the treatment areas for all or part of their life cycle. Some species would recover quickly and would reoccupy the sites, although others may be displaced for longer, until the habitat conditions required by the species become reestablished. Over the long term, treatments are expected to produce a positive impact to mule deer, elk, pronghorn, and other wildlife species in the Project area. Health, vigor, and productivity of sagebrush-steppe habitats would see an incremental improvement. Sagebrush/grass habitats would be returned to a more natural state, allowing for rejuvenation of understory grass and shrub species while still providing tree cover for concealment, foraging, thermal cover and nesting. The monotony of vast acreages of one dominant vegetation type would be broken up, providing a diversity of age classes and habitat types to wildlife creating “edges” which are important for many wildlife species.

Alternative B- No Action

Migratory Birds, Special Status Species and General Wildlife

Under this alternative, there would be no direct impacts because no active management activity would occur. However, indirect impacts from not taking action could lead to a continued decline in the overall quality of the habitat for most species within the analysis area.

Pinyon-juniper encroachment of historic sagebrush/grassland would continue, robbing nutrients from and displacing existing shrubs, grasses, and forbs. Animal diversity would most likely decrease as one vegetation type would dominate the landscape. Sage-grouse, mule deer, elk, brewer’s sparrow, sage sparrow, sage thrasher, loggerhead shrike, vesper sparrow and other species which depend on a diverse sagebrush/grassland habitat may suffer incremental population declines. Species such as gray flycatcher, Bewick’s wren, pinyon jay and juniper titmouse may see an incremental increase in population because they are more adapted to a forested environment.

Dense, decadent stands of sagebrush with no understory would continue to be a concern for species adapted to a sagebrush environment with a diversified understory. Soil erosion potential would increase while the potential for the soil to store water would decrease. These losses of growth medium and water storage capacity would only accelerate the decline in the overall quality of the habitat as a whole. Additionally, wildfire events have the potential to burn thousands of acres at high temperatures. These types of fires may lead to complete habitat conversion from a sagebrush/grassland to invasive annual grassland dominated by undesirable species. The landscape-level benefits to all wildlife species by providing a mosaic of diversified habitats would not be realized.

3.4.5 Fuels and Fire Management

Alternative A- Proposed Action

Treatments identified under the Proposed Action would help reduce hazardous fuel loads, create fuel breaks, and reduce the overall threat of a catastrophic wildfire event impacting private property and threatening firefighter and public safety, simply by reducing the overall fuel loads. Additionally, creating mosaics of treated and untreated vegetation would provide opportunities to manage fire for resource benefits in the future.

Removing and/or thinning pinyon and juniper in a mosaic pattern would break up continuous fuel and reduce the risk of a high intensity wildfire entering this area. Because there is a greater risk of conversion of shrublands to annual grasslands under a high intensity fire, managed, proactive treatments under the Proposed Action would reduce the likelihood of cheatgrass invasion and help native grasses and forbs persist in the long term.

Treatments in and around the sagebrush areas would break up continuous fuels and reduce the risk of wildfire entering these sensitive areas. Treatments designed to create a variety of age classes of sagebrush would reduce the potential for high intensity fire, should a fire enter these areas, allowing fire to play a more natural role.

The treatments proposed would help to effectively return these areas to a fire regime closer to the historical range (Fire Regimes 1 and 2), where fire plays an essential role in the ecosystem. These treatments would be effective in breaking up contiguous acres of fuels, increasing the potential for firefighters and resource managers to contain the fire and/or to utilize a fire for resource benefits. Mechanical treatments tend to mimic natural events (such as low-intensity wildland fire) and would be compatible with achieving sagebrush habitat enhancement objectives in this area.

Alternative B- No Action

Under the No Action alternative, the Project area would remain in a moderately (FRCC2) and substantially (FRCC3) altered state outside of the historical fire regime. Small fires would continue to occur throughout the Project area. However, existing and accumulating surface fuels would lead to a greater probability of a large, high intensity, catastrophic fire in the long term.

Under the No Action alternative, there is not an opportunity for pro-active vegetation rehabilitation (re-seeding following treatment Projects). Instead, areas not treated are left more susceptible to high intensity fire, making seeding following a fire more expensive and potentially less effective. There is also an increased potential for sagebrush steppe areas to convert to cheatgrass following wildfire, which can result in more frequent wildfires in the future. The short cheatgrass burn-growth cycles can lead to increased erosion and long-term depletion of soil organic matter.

3.4.6 Hydrologic Conditions, Water Resources/Quality, and Wetlands/Riparian Zones

Alternative A- Proposed Action

Hydrologic Conditions

In the short term, implementation of the Proposed Action could lead to decreases in surface runoff due to improved infiltration in chained or harrowed areas. Substantial tree mulch in masticated areas would also reduce surface runoff and increase organic matter content in upper soil horizons. Downed, hand thinned trees also break up overland flow pathways and can help improve infiltration and reduce erosion. In the long term, as vegetative cover continues to increase and bare ground decreases, treatments are expected to lead to noticeably healthier, more diverse vegetation communities. This would lead to increased soil stability, increased soil infiltration and reduced surface runoff from lands within the Project area.

Water Resources/Quality

Short-term surface runoff could impact water quality in the intermittent and ephemeral streams and washes in and downstream of the Project area. The ability of the treated areas to capture and store water due to furrows and mulch would largely alleviate this concern. Given the high sediment load typically carried by local ephemeral washes when flowing, however, any additional sediment from treatment actions would be negligible. Long-term reductions in surface runoff would likely result in reductions of sediment being deposited in area streams. Water quality in Johnson Wash and Kanab Creeks, which is currently impaired for several parameters including total dissolved solids, could be slightly impacted by increased sediment runoff immediately following treatments. In the long term, however, projected reductions in surface runoff should result in positive effects to water quality in these streams. Increased soil infiltration could also result in positive impacts to area water resources in the long term, as this could lead to increased recharge of local aquifers and potentially greater flow from springs (Bedell et al. 1993).

If chemicals are used for vegetation treatments, there could be impacts from runoff, with the degree of impact being dependent on timing of the application, half-life of the chemical, vegetation cover, landscape type and position, and other variables. All state and federal laws would be followed in the application of chemicals, and best management practices would be employed to minimize any unintended impacts from chemical treatments.

Wetlands/Riparian Zones

There would be no direct effects to wetlands or riparian vegetation from the Proposed Action, as these areas would not be targeted in vegetation treatments. Indirect effects from runoff are possible if sediment transport is excessive or if chemicals used for vegetation treatments run on to riparian areas. As noted above, compliance with state and federal laws, and the use of best management practices, would minimize unintended impacts from such treatments. Another indirect effect is slowing incision and potentially causing aggradation in gullies, which could bring water tables nearer to the surface over the long-term and help support existing wetlands or create new ones. In the long term, increased infiltration from improved vegetation and soil condition could result in increased flow in streams and springs and improvement in riparian habitat.

Alternative B- No Action

Hydrologic Conditions, Water Resources/Quality, and Wetlands/Riparian Zones

Under this alternative, there would be no direct impacts to these resources because no active management activity would occur. However, indirect impacts from not taking action could lead to a continued decline in the overall quality of these resources within the Project area. As pinyon-juniper continues to invade and

sagebrush stands become more decadent, bare ground would increase resulting in decreased infiltration and increased surface runoff. The decreased infiltration could lead to lower perennial flow in streams and springs, reducing the quantity and quality of riparian habitat. High intensity fire from unmanaged fuel loads would negatively impact hydrologic conditions, water quality and wetland/riparian areas.

3.4.7 Rangeland Health and Livestock Grazing

Alternative A- Proposed Action

Rangeland Health

Rangeland conditions are expected to improve following implementation of the proposed vegetation treatments. The health, vigor, recruitment and production of perennial grasses, forbs, and shrubs would improve which would provide a more palatable and nutritional source of forage for both livestock and wildlife, and also protect the soil resource and other associated watershed values. The rejuvenation of decadent even-aged stands of sagebrush and removal of invading pinyon-juniper woodland would assist in improving the ecological condition of sites within the Project area.

Implementation of the Proposed Action would assist those portions of allotments within the Project area in conforming to Standard No. 3 of the Utah Standards for Rangeland Health and the Fundamentals of Rangeland Health (Title 43 CFR 4180) by increasing the quantity and quality of herbaceous and graminoid vegetation. This increase in ground cover would support infiltration, stabilize soils, and allow the soil to maintain its moisture storage properties. The Project would also assist in supporting healthy biotic communities by increasing the amount of litter, and by improving the overall production of grasses, forbs, and shrubs.

Livestock Grazing

Implementation of the Proposed Action would eventually improve overall livestock performance and improve the economic stability of the permittees due to an overall long-term increase in the quantity and quality of grasses and other herbaceous forage which are important to livestock grazing. With an increase in the production and vigor of herbaceous plant communities, the forage base would more adequately support the existing herd sizes and would improve overall livestock performance (e.g. increased cow weights, increased calf crops, increased weaning weights, etc.) These allotments help support a traditional and historical lifestyle for permittees in the vicinity of Kane County, Utah, who depend on the allotments to help generate a portion of their annual income. Implementation of the Proposed Action should eliminate a potential need for future reductions in stocking rates which would adversely affect the permittees' long-term economic goals and objectives.

Implementation of the Proposed Action may have a short-term economic effect on the permittees due to a mandatory rest period of the treatment areas to ensure the establishment, protection and long-term viability of the vegetation enhancement Project. The rest period would be for a minimum of two complete growing seasons but may be extended pending the rate of progress towards vegetative establishment. Seed germination, drought-related influences, wildfire or other natural unforeseen events could potentially affect the rate of vegetative establishment and lengthen the rest period.

Alternative B- No Action

Rangeland Health

Under the No Action Alternative, rangeland conditions are expected to remain the same for the short term and decline in condition over the long term. The health, vigor, recruitment and production of native and non-native, perennial grasses and native shrubs would decline in the long term due to a combination of

factors including continued grazing and browsing use by livestock and wildlife and competition for nutrients, sunlight and precipitation with older, decadent shrubs and invasive pinyon and juniper.

The No Action Alternative may also eventually prevent portions of the allotments within the Project area from conforming to Standard No. 3 of the Utah Standards for Rangeland Health and the Fundamentals of Rangeland Health (Title 43 CFR 4180) due to reduced levels of native, herbaceous vegetation.

Livestock Grazing

The No Action Alternative is expected to eventually affect overall livestock performance and economic stability of the permittees due to a reduction in the quantity and quality of grasses and other herbaceous forage in areas invaded by pinyon and juniper. With a reduction in the production and vigor of herbaceous plant communities, the forage base may not adequately support the existing herd sizes and would adversely affect livestock performance (e.g., reduced cow weights, reduced calf crops, reduced weaning weights, etc.). Some permittees are dependent on their allotments to help generate a large portion of their annual income, while other permittees have alternate sources of income and depend on the allotment for supplemental income. The need for a future reduction in stocking rates may adversely affect the permittees' long-term economic goals and objectives.

3.4.8 Recreation

Alternative A- Proposed Action

During implementation of land treatments, recreational activities in the Project area could be disrupted. Treatment activities that may involve loud machinery, smoke-producing fires, application of chemicals, or the visible presence of work personnel would likely deter visitors from recreating in treatment areas. These visitors as well as SRP-holders could be displaced to areas that are not undergoing treatment or may depart the area entirely. Because this is a phased Project, the impacts to recreation would be dispersed over time among up to 15 different treatment areas, likely many years apart. The overall impacts to recreation over the Project area would be low to moderate on any given year.

In the short to mid-term, treated areas may become more or less attractive to the recreating public, depending on the nature of their activities and preferred settings. For instance, the removal of trees may enhance wildlife viewing and hunting opportunities but might also discourage photographers or sightseers in search of natural-appearing landscapes. The degree of these impacts would depend on how these treatments are integrated into natural landscape features and adjacent untreated areas.

Areas where tree cover is removed near dispersed camping areas, particularly along roadways, would be impacted. Camping opportunities that allow for shade, seclusion, and privacy may be reduced by Project activities. These impacts would be alleviated by Project design which will incorporate high-use campsites into remaining areas of vegetation. As recreation increases, visitors may need to travel farther to locate suitable sites, or camp in close proximity to one another. Concentration or dispersal of such recreational activities may cause the establishment of new, user-created campsites. Cross-country vehicular travel has the potential to increase as recreationalists search for, create, or travel to new campsites. Conducting the Project activities in phases is likely to mitigate many of these potential impacts and spread them out over many years. The removal of encroaching pinyon-juniper stands may prompt operational changes for some SRP-holders. Permitted groups such as wilderness therapists may need to concentrate groups into small patches of untreated areas, limit the number of groups operating in an area, or disperse to other authorized areas. Impacts may include additional encounters between permitted groups, the temporary displacement of public recreational visitors, the migration of recreational use impacts to other areas, and diminished therapeutic outcomes for wilderness therapy clients.

In the long term, as vegetation becomes re-established, most negative impacts from the Proposed Action would diminish. Monitoring of campsite occupancy in treated areas would improve Project design for each subsequent phase of the Proposed Action and allow for adaptive management to meet recreational demand. Improved habitat for wildlife, including many game species, would enhance recreational opportunities for wildlife viewing and hunting.

Alternative B- No Action

Under the No Action alternative, there would be no expected change from current recreation uses and opportunities. Recreational activities as noted above would continue in various degrees. New types of recreation or changing demands may shift usage of these areas, but it is not possible to predict these actions.

3.4.9 Lands with Wilderness Character

Alternative A- Proposed Action

The Upper Kanab Creek unit is approximately 46,000 acres in size, and 5,120 acres of this unit lie within the proposed Project area. Under the Proposed Action, of this 46,000-acre unit, approximately 1,953 acres or roughly 4% would be treated (or in some cases, re-treated). As a result of Project-related vegetation removal, treated areas within the unit would likely see a short-term (0-2 years) reduction in the naturalness and (to a lesser degree) outstanding opportunity for solitude, both of which are used to identify lands with wilderness characteristic. With treatment edges designed to mimic natural vegetation stand edges, impacts to the supplemental values (roadside scenery and important geological features) identified in the 1999 wilderness inventory evaluation (BLM 1999) would be minimal. Over the short term, these impacts would be noticeable. Over the long term (approximately three to five years) impacts from the Project would become less noticeable to the general public and would likely appear natural. Adverse impacts would generally decrease over time.

Alternative B- No Action

Under the No Action alternative, there would be no change to current management, and therefore no impacts to lands with wilderness character within the Project area.

3.4.10 Woodland/Forestry

Alternative A- Proposed Action

Treatments included in the Proposed Action would decrease the density and extent of pinyon-juniper woodlands, and open up dense, even-aged sagebrush stands. Because the treated areas consist of slopes less than 30 percent, do not target rock outcrops, and contain some shrub understory, it is expected that the majority of pinyon-juniper targeted for treatment are post-settlement (<150 years). Observation of woodland tree growth forms can provide an indicator of pre-settlement (>150 years), old growth trees vs. post-settlement woodland trees (Appendix E, Woodland Tree Growth Form and Morphological Characteristics) (Tausch et. al 2009). Old growth stands are not a target of the proposed activities and impacts are expected to be negligible.

Selective thinning of mature trees would increase stand health, while also providing thermal cover needs of large ungulates, such as deer and elk. Thinning of mature trees may not fully meet fuels management objectives, as larger trees would still be susceptible to crown fire, but the threat of catastrophic fire would be reduced.

Sagebrush treatments are intended to improve the overall health of sagebrush communities by increasing age class diversity and allowing a more open canopy for grasses, forbs and shrubs. Impacts to woodland

species would be negligible as these areas were likely sagebrush/grassland sites prior to European settlement. Removal of pinyon and juniper and other ladder fuels within areas occupied by ponderosa pine would help maintain healthy and productive stands of ponderosa pine within the Project area.

Alternative B- No Action

No alteration in the current processes (pinyon and juniper infilling and encroachment) or trends would be initiated through management actions. Pinyon-juniper would continue to increase in density (number of stems per acre) and can be expected to continue to replace sagebrush and grasslands in this area, as such processes are already evident. Pinyon-juniper stands would also be increasingly susceptible to catastrophic wildfire as these trends continue. Ponderosa pine stands would continue to infill with understory ladder fuels (pinyon and juniper). This would increase the potential of a high intensity crown fire in the area, which could remove ponderosa pine from the Project area.

3.4.11 Vegetation, Special Status Plant Species, and Invasive Species

Alternative A- Proposed Action

Under the Proposed Action, there would be an expected increase in desirable shrubs, grasses, and forbs following implementation of the proposed vegetation treatments. The health, vigor, recruitment, age class, diversity and production of perennial grasses, forbs, and shrubs would improve. Removal of pinyon and juniper would allow grasses, forbs, and shrubs to establish and compete for sunlight, nutrients and water. In addition, there would be variable height and canopy cover from vegetation. Invasive species often occupy disturbed areas and therefore in the short-term, it is likely that their presence within the Project area would increase. As seeded vegetation establishes, invasive species presence would decrease and be held in check. In areas where there is not a sufficient understory of grasses and forbs, seeding a desired mix of grasses and forbs would decrease the risk of establishment of invasive species following treatments.

The Proposed Action would have little or no direct impacts to the sensitive plant species due to Project design features. Sensitive plant species that would survive better in open canopies may see an improvement in vigor and distribution as areas that are currently dominated by pinyon-juniper are opened up, allowing more sunlight, nutrients and precipitation to reach the ground.

Alternative B- No Action

Under this alternative, there would be no treatment of vegetation. Pinyon and juniper would continue to increase in density and would continue to limit the site potential for the recruitment and establishment of grasses, forbs, and shrubs. The health, vigor, recruitment, age class, diversity and production of existing shrubs, forbs, and perennial grasses would decline, and there would continue to be a long-term loss of understory species and loss of variable canopy cover and height.

Additionally, because of the current condition of the Project area, with many areas lacking in vegetation cover and diversity, there would be an increased opportunity for invasive plant establishment following wildfire and associated disturbance.

Sensitive plant species that require more open canopies would continue to decline as the forest closes in and increases in density.

3.4.12 Visual Resources

Alternative A- Proposed Action

The proposed vegetation treatments would be designed, as noted in the Proposed Action, to mimic natural appearing edges between vegetation types and to resemble natural openings and clearings in the vegetation

patterns, such that contrasts in form, line, color and texture would be minimized in an attempt to meet VRM objectives. Without proper planning in treatment layout and implementation, contrasts may be sufficient to create failure to meet VRM objectives in the first three to five years following treatment. Also, if heavy equipment is used to implement treatments, its presence could create obvious dominant visual contrasts in the immediate vicinity of the equipment but would be of very short-term duration.

In the long term, once stands of various aged vegetation and a less homogeneous mix of vegetation are established, the visual variety created by the Proposed Action could result in a more interesting visual landscape. Evidence of man-made landscape/vegetation alterations would diminish considerably after about three to five years, especially if care is taken during treatment to lay out planned units and employ treatment methods and processes to minimize unnatural-appearing contrasts in vegetative type, diversity and cover patterns.

Treatment areas may be especially noticeable to the casual observer during implementation and during the short term when dead vegetation or bare ground is visually obvious, but visual resource objectives could be met for the long term in all VRM class areas if Proposed Action design criteria and implementation processes are specifically developed and followed with VRM objectives given priority. The BLM would write an implementation plan to include design criteria and specific implementation processes.

Alternative B- No Action

Under the No Action alternative, there would be no human-caused alterations to the existing landscape, so VRM objectives in the Project area would continue to be realized. However, failure to conduct vegetation treatments could result in large, uncontrolled wildfires which could alter the landscape and create dramatic visual contrasts. Such contrasts would appear natural to visitors, so the altered landscape could be visually attractive to purists who understand and appreciate such natural processes, or they could be unattractive to visitors who are not appreciative of fire scars, tree skeletons, and blackened landscapes. Wildfire scars and visual contrasts would be mitigated naturally with the passage of time, as vegetation gradually invades and replenishes the openings created by the initial conflagration.

3.5 Cumulative Impacts

The cumulative effects analysis area (CEAA) is much broader than the actual Project footprint itself, and includes the entire boundary of the GSENM (prior to Proclamation 9682 of Dec. 4, 2017), merged with the HUC 8 watershed (Kanab Creek), within the state of Utah. This geographic extent contains similar topography, land uses, climate, past and present management actions and species compositions. This CEAA totals 2,185,018 acres[3] (see Figure A16, Appendix A). The past, present and reasonably foreseeable future actions (RFFAs) applicable to the CEAA are identified below in Table 9. In addition, the RFFAs within the CEAA would include any fuel reduction treatments that may occur on private land within and adjacent to the Project area.

Table 9. Past, Present and Reasonably Foreseeable Future Actions Applicable to the Assessment Area.

Project/Action	Name or Description	Status (x)		
		Past	Present	Future
Agriculture	Farming and range improvements on private lands within and adjacent to the Project area	X	X	X
Historic Livestock Grazing (1870s)	1870s to 1934 unregulated grazing on public lands led to vegetative community changes	X		

[3] The CEAA for visual resources is different than the area described in Section 3.5; the unique CEAA for visual resources is presented in Section 3.5.12.

Project/Action	Name or Description	Status (x)		
		Past	Present	Future
Invasive Weed Treatment	Invasive weed treatment (spraying for Scotch thistle) has been conducted in small portions of Project area	X	X	X
Off Highway Vehicle (OHV) use	OHV use occurs on open as well as existing routes within the Project area for hunting, shed antler gathering, and recreation	X	X	X
Permitted Livestock Grazing	Issuance of ten-year grazing permits for the allotments throughout the KFO Area and GSENM and construction of grazing infrastructure	X	X	X
Land Use Authorization and Permitting	Permits/authorizations for rights-of-way for utilities and other infrastructure requiring use of BLM lands	X	X	X
Road Construction and Maintenance	Construction of new roads and maintenance of existing roads	X	X	X
Special Recreation Permits (SRPs)	Permitting to authorize recreational activities and programs such as hunting, camping, OHV tours, therapy programs, photography, etc.	X	X	X
Rangeland Seedings/Vegetation Manipulation Projects[4]	Several large chaining projects in the 1960s and 1970s have occurred to promote primarily livestock. Limited use of prescribed fire, hand thin and mechanical mulch re-treatments, have occurred as restoration projects.	X	X	X
Wildfire Suppression	Wildfire suppression activities (typically full suppression) throughout the KFO Area and GSENM in non-wilderness or WSA	X	X	X
Woodland products harvesting	Tree harvesting (primarily for fence posts) and firewood gathering near roads occurred in the past. With the creation of GSENM, two wood cutting areas were identified, neither of which are within the Project area but are within the CEAA.	X	X	X

3.5.1 Soil and Biological Soil Crusts

Much of the current condition of the soils and BSCs in the CEAA is a result of unregulated historic livestock grazing and ongoing wildfire suppression. This has led to an unnatural fire regime and has allowed for the invasion of pinyon-juniper trees into areas historically dominated by other vegetation types. Cumulatively, this altered condition is beginning to have landscape level consequences. Adoption of the Proposed Action alternative would help to reverse the trends initiated by these actions, and therefore result in beneficial impacts to soils and BSCs, thus minor improvements within the CEAA could be expected.

Under the No Action alternative, soil loss and reduced infiltration rates would continue. Upland erosion would continue to increase through gully formation and head-cutting, further impacting the watershed and limited riparian resources. These negative conditions would be exacerbated by existing soil and water movement occurring within the watershed. Therefore, the No Action alternative could result in cumulative impacts that could negatively affect the resource over time.

3.5.2 Cultural Resources and Native American Religious Concerns

Archaeological sites identified and determined to be eligible for the NRHP have traditionally been avoided when conducting vegetation treatments. However, consistently avoiding eligible sites can result in creating

[4] Past treatments conducted prior to the 2000s were primarily intended to increase livestock forage; whereas the primary objective of modern treatments (i.e., conducted within the past decade or future treatments) is ecological restoration.

"islands" of untreated vegetation which increase visibility and can result in the vandalism or looting of eligible sites. That is why, under the Proposed Action, each eligible site identified would be evaluated for the potential to treat the site without affecting qualities that contribute to the site's eligibility.

In addition, failing to treat the vegetation on sites dominated by pinyon-juniper over the course of time could result in a reduction in the shrubs, grasses and forbs that stabilize soils, thus allowing for an increase in erosion, impacting the integrity of sites. Therefore, the No Action alternative could result in cumulative impacts that could negatively affect the resource over time.

3.5.3 Air Quality

Several of the RFFAs generate minor, short-term impacts to air quality in the region. Adoption of the Proposed Action would also generate similar minor, short-term impacts. However, improvements in understory vegetation cover and soil stability would result in long-term beneficial cumulative impacts to air quality due to a reduction in airborne dust during wind events.

The No Action alternative would see continued, short-term impacts to air quality, including potential increases in airborne dust during wind events due to ongoing degradation in understory vegetation cover and soil stability.

3.5.4 Fish and Wildlife

Historic and permitted livestock grazing, past vegetation projects, and wildfire suppression have altered habitat for wildlife species within the analysis area, with beneficial impacts to some species and adverse impacts to others. The general trend in habitat quality, however, has been downward for most species, including special status species such as the GRSG. The Proposed Action would improve vegetation health and diversity and return treated areas to vegetation types more similar to those in existence prior to European settlement, which should generally result in beneficial cumulative impacts to most wildlife species.

The No Action alternative would result in continued degradation of habitat quality for most sagebrush-steppe wildlife species, and therefore result in continued adverse cumulative impacts to these species.

3.5.5 Fuels and Fire Management

Historic livestock grazing and wildfire suppression across the analysis area have resulted in increased woody fuel loads which make it difficult for fire to play its natural role on the landscape. Past vegetation manipulation projects have reversed this trend in limited areas, but the overall impact to fuels and fire management has been adverse. The Proposed Action would address the problem of woody fuels on a landscape scale, and therefore result in beneficial cumulative impacts to fuels and fire management, helping to reinstate historic, low-intensity fire regimes and improve safety to the public, firefighters, private landowners and communities located near this area.

The No Action alternative would result in adverse cumulative impacts, with a continued buildup of woody fuels and ever-increasing risk of high intensity wildfire

3.5.6 Hydrologic Conditions, Water Resources/Quality, and Wetlands/Riparian Zones

Past, present, and reasonably foreseeable actions have generally had minimal, but incremental adverse impacts to these resources, due to decreased soil stability and infiltration, as well as degradation of wetland vegetation at unfenced springs from livestock grazing. Implementing the Proposed Action would not have any adverse cumulative or incremental impacts on water resources, wetlands, or riparian zones because fuel

reduction treatments would avoid those areas. Over the long term, the Proposed Action should result in beneficial impacts to these resources due to increased soil stability and infiltration.

The No Action alternative would result in continued incremental adverse cumulative impacts to these resources.

3.5.7 Rangeland Health and Livestock Grazing

Livestock grazing in the region has evolved and changed considerably since it began in the 1870s and is one factor that has contributed to the current environment. At the turn of the century, large herds of livestock grazed on unreserved public domain in uncontrolled open range. Eventually, the range was stocked beyond its capacity, causing changes in plant, soil and water relationships. Some speculate that the changes were permanent and irreversible, turning plant communities from grasses and other herbaceous species to shrubs and trees. Protective vegetative cover was reduced, and more runoff brought erosion, rills, and gullies.

In response to these problems, livestock grazing reform began in 1934 with the passage of the Taylor Grazing Act. Subsequent laws, regulations and policy changes have resulted in adjustments in livestock numbers, season of use and other management. Given the past experiences with livestock impacts to resources on public lands, as well as the cumulative impacts that could occur on the larger ecosystem from grazing on various public and private lands in the region, proper management of livestock grazing is an important factor in ensuring the protection of public land resources. Implementation of the Proposed Action would improve rangeland health in the Project area and ensure that livestock grazing does not adversely impact this resource.

The No Action alternative would not change the current ecological conditions or livestock grazing management from a short-term perspective, but if vegetation and soil health continues to degrade with pinyon-juniper encroachment reductions in herd sizes could be necessary in the future, resulting in adverse cumulative impacts to permittees utilizing the Project area.

3.5.8 Recreation

Past, present, and reasonably foreseeable actions include those associated with items listed in Table 9. Notable actions for recreational impacts include past vegetation manipulation projects (large chaining projects in the 1960s and 1970s), maintenance of designated roads, and an increase in recreational visitation to the general region. These actions may have resulted in adverse impacts for some users, though they may have been beneficial for others.

The action alternative would not contribute to measurable changes in impacts because design features allow for preservation of recreational opportunities. By preserving tree cover at existing campsites, ensuring treatments integrate with the natural landscape, and implementing phases to avoid SRP-holder high-use areas, adverse impacts to recreational uses and opportunities would be minimized.

The No Action alternative would not alter the current situation with regard to recreation, and cumulative impacts would be generally neutral.

3.5.9 Lands with Wilderness Characteristics

Activities and events which may impact lands with wilderness characteristics include OHV use, livestock grazing, and vegetation manipulation projects. Adverse impacts have resulted from OHV use and livestock grazing and illegal OHV use may increase these impacts over time. Previous vegetation manipulation projects may in some cases have had more long-term adverse impacts to the wilderness character. The Proposed Action could adversely impact the roughly 2,000 acres of lands with wilderness character

proposed for treatment. However, in the context of the roughly 46,000 acres of lands with wilderness character of the Upper Kanab Creek unit and the hundreds of thousands of acres of LWC within the CEAA, these activities would have relatively minor cumulative impacts to lands with wilderness character and are expected to decrease over time.

The No Action alternative would likely result in neutral cumulative impacts to lands with wilderness character in and around the Project area.

3.5.10 Woodland/Forestry

Historic livestock grazing, past vegetation manipulation, and wildfire suppression have impacted this resource in both adverse and beneficial ways, although the overall trend is toward less healthy woodland and shrubland communities. The Proposed Action would produce beneficial impacts in returning the woodlands and shrublands of the Project area to a more natural state, resulting in positive cumulative impacts to the resource.

The No Action alternative would maintain the current trends in this resource resulting from past and ongoing actions, with a gradual degradation in the health of woodlands and shrublands, resulting in increased risk of catastrophic wildfire. Therefore, the No Action alternative could result in cumulative impacts that could negatively affect the resource over time.

3.5.11 Vegetation and Invasive Species

Most of the past, present, and reasonably foreseeable actions impact the vegetation communities in and around the CEAA, with historic livestock grazing and wildfire suppression, in particular, producing adverse impacts to the health of native vegetation communities. Beginning in the 1960's, rangeland seedings had the primary focus of increasing forage for livestock. Approximately 60,000 acres within the CEAA were treated in this manner. With the creation of the Monument in 1996, the focus of vegetation projects has shifted to ecological restoration for the benefit of many resources. Approximately 20,000 acres have been treated in the recent past with these objectives in mind.

The total acreage of land that has been previously treated within the CEAA is approximately 80,000 acres or approximately 3.7%. Presently within the CEAA, vegetation work is ongoing on portions of the KFO where approximately 3,000 acres are proposed for treatment this coming year. There are currently proposals (in early planning stages) to conduct vegetation treatments on approximately 13,460 acres (Alvey Wash, Coal Bench, and Last Chance Vegetation Restoration Projects), as well as up to 93,363 acres for the Upper Paria Watershed Project. Therefore, it is reasonably foreseeable that an additional 109,823 acres could also be treated in the coming decades. In combination, when considering past, present, and reasonably foreseeable vegetation treatments within the CEAA, still only 10% of the landscape would see any type of vegetation treatment (see Figure 12, below). Past vegetation manipulation Projects have generally resulted in localized improvements to vegetation communities, and some of the healthiest sagebrush-steppe communities currently remaining in the CEAA are found in these old treatment areas. Implementation of the Proposed Action would not measurably contribute to any negative impacts from these past actions but may provide opportunities for the expansion of understory vegetation cover, including native perennial grasses and forbs, and result in beneficial cumulative impacts to vegetation cover along with reduced susceptibility to invasive species infestations after wildfire.

The No Action alternative would see a continuation of current trends in vegetation communities and invasive species resulting from past, present, and RFFAs, with a gradual degradation of vegetation health and increased susceptibility to infestation by invasive species, particularly if catastrophic wildfire were to occur in the dense pinyon-juniper woodlands that dominate much of the Project area.

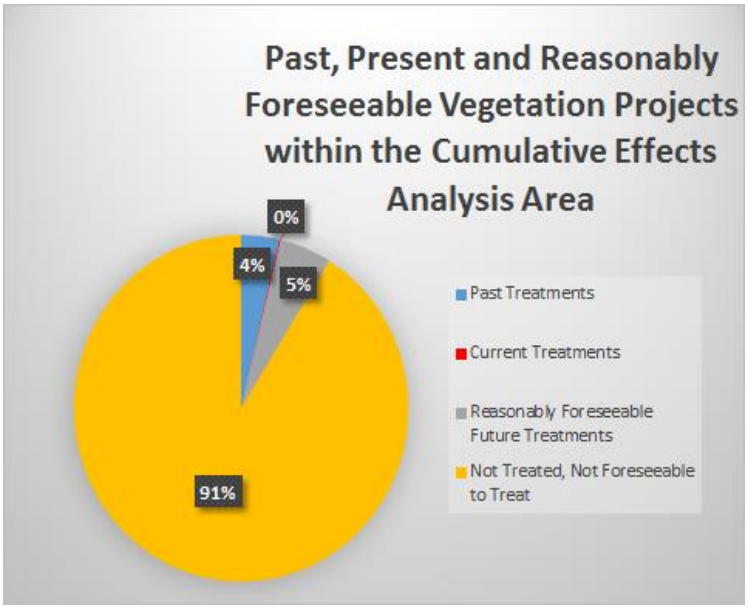

Figure 12. Percentage of Vegetation Projects within the CEAA

3.5.12 Visual Resources

The cumulative impact area of analysis for Visual Resources is the Project Area and locations beyond it out to 15 miles where the treatments may be visible. The cumulative impacts to visual resources from past, present, and reasonably foreseeable actions include those associated with items listed in Table 9. The Proposed Action would not contribute to a measurable increase in long term negative impacts to visual resources as the treatments would be designed and implemented to blend with the natural landscape character and meet VRM Class II and III objectives as appropriate. Successful restoration efforts would return areas to native plant communities thus improving the overall character of the landscape.

The No Action alternative also would not contribute to an increase in long term negative impacts to visual resources as vegetation composition would remain the same or trend toward denser stands of pinyon-juniper forests which to the casual observer are characteristic.

4 CONSULTATION AND COORDINATION

4.1 Introduction

The issue identification section of Chapter 1 identifies those issues analyzed in detail in Chapter 3. The IDT Checklist provides the rationale for issues that were considered but not analyzed further. The issues were identified through the public and agency involvement process described in sections 4.2 & 4.3 below.

4.2 Persons, Groups, and Agencies Consulted

Table 10. Persons, Agencies, and Organizations Consulted

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
Utah Div. of Wildlife Resources	Consult with UDWR as the agency with expertise on impacts on game species.	Data and analysis regarding big game species incorporated into Chapters 3 & 4.
Color Country Adaptive Resource Management Sage Grouse Working Group	Consult with sage-grouse working group in regard to priority treatment/avoidance areas for sage grouse.	In a December 13, 2018 meeting, this local sage-grouse working group fully supported the EA and subsequent vegetation treatments. Their data, research and analysis regarding sage grouse were incorporated into Chapters 3.
Utah Partners for Conservation and Development/Utah's Watershed Restoration Initiative	Consult regarding priority watersheds and areas for treatment through the Southern Region UWR team.	Focus area priorities and potential funding incorporated into overall plan.
Paiute Indian Tribe of Utah	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 1531)	A scoping letter was sent to the Paiute Indian Tribe of Utah on November 21, 2016. The tribe had no comment on the Project. A notice of review of the draft EA was sent to the Paiute Indian Tribe of Utah on November 2, 2018. The Piute Indian Tribe had no comments or objections to the Project.
The Hopi Tribe	Consultation as required by the American Indian Religious Freedom Act of 1978 (42 USC 1531) and NHPA (16 USC 1531)	A scoping letter was sent to the Hopi tribe on November 21, 2016. The tribe responded in a letter dated November 30, 2016, that they would like to see the cultural resources survey report and draft EA for comment. A notice of review of the draft EA was sent to the tribe on November 2, 2018. The Hopi tribe had no comments or objections to the Project.

4.3 Summary of Public Participation

The public was notified of the Project by a notice posted on the BLM ePlanning Register and by a scoping letter sent out to interested individuals and organizations on November 21, 2016. A news release was also published in local newspapers to solicit comments to assist with the EA preparation. Comments received in response to this solicitation were used to identify potential environmental issues related to the Proposed Action and to identify alternatives to the Proposed Action that would meet the Purpose and Need for the

Project (see Section 1.7 for details of comments and issues raised). Comments on scoping were requested back to the BLM by December 22, 2016, although BLM continued to receive and accept comments well beyond the 30-day comment period. BLM employees also held a public forum at the Kanab City Library in February 2017 to discuss this Project and other vegetation related Projects in general.

A public tour of an adjacent Project area as well as parts of the Skutumpah Terrace Project area was held on Friday, November 2, 2018. Numerous members of the public attended the tour and offered comments, insights, and suggestions regarding vegetation restoration. On Friday, November 2, 2018, the public was notified of the availability of the draft EA as well as a draft Finding of No Significant Impacts (FONSI) through BLMs E-planning website as well as through a letter sent out to approximately 100 interested publics. The public had until December 3, 2018 to submit comments.

4.3.1 Comment Analysis and Response to Public Comment

During review of the draft EA (November 2 to December 3, 2018), the BLM received a total of 14 comment letters from groups and individuals. For a complete list of those who provided comments during review of the draft EA, refer to Key to Commenters, Appendix G. Each comment letter received was given a numerical identifier (1 through 14). Substantive comments within each letter received were also given an identifier in numerical order. For example, for comment letter 1, the substantive comments were numbered within the letter as 1-1, 1-2 and so on. This was done for all 14 letters received to account for all substantive comments. Many of the comments received had similar themes such as “use of native seed” or “biological soil crusts” etc. Comments with similar themes were grouped and added to a comment matrix which is organized by theme. Within the comment matrix, the BLM responded to each comment with rationale for why an issue was or was not considered in the preparation of the EA. The BLM comment matrix for the draft EA is located in Appendix F, BLM Response to Comments.

4.4 List of Preparers

Table 11. BLM Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Cameron McQuivey	Team Leader, Wildlife Biologist	Document technical coordination and quality control; impact analysis for wildlife resources including general wildlife, USFWS designated species, game species, and BLM sensitive species
Paul Leatherbury	Geographic Information Systems Specialist	Project-related maps
Kenneth (Brandon) Johnson	Environmental Coordinator	Project oversight, document technical review and quality control
Raymond Brinkerhoff	Botanist	Impact analysis for botanical and range resources including Biological Soil Crusts, invasive species/noxious weeds, USFWS threatened/ endangered/ candidate plant species, wetlands/riparian zones, and vegetation excluding USFWS designated species
Brian Amstutz	Outdoor Recreation Planner & Special Recreation Permits Administrator	Impact analysis for recreation
Jason Bybee	Rangeland Management Specialist	Impact analysis for air quality and greenhouse gas emissions

Erik Vernon	Atmospheric Scientist/Air Resource Specialist	Impact analysis for air quality, climate change and greenhouse gas emissions
Matthew Zweifel	Archeologist	Impact analysis for cultural resources and Native American religious concerns
Allysia Angus	Landscape Architect	Impact analysis for visual resources
Dana Backer	Science Program Administrator	Impact analysis for environmental justice, farmlands (prime or unique), sensitive plants, and socio-economics
James (Ken) Bradshaw	Soil Scientist	Impact analysis for floodplains, hydrologic conditions, soils, water resources/quality (drinking/surface/ground)
William (Allan) Bate	Assistant Monument Manager Resources (Acting)	Impact analysis for fuels/fire management and woodland/forestry
Sean Stewart	Rangeland Management Specialist (Lead)	Impact analysis for livestock grazing, Rangeland Health Standards, and wild horses and burros
Jeffrey (Jabe) Beal	Outdoor Recreation Planner	Impact analysis for Lands with Wilderness Characteristics

Table 12. Non-BLM Preparers

Name	Title	Responsible for Following Section(s) of Document
Stephanie Treptow (Consultant)	Team Leader and Contract Administrator	Administrative coordination and quality control
Jean Marie Rieck (Consultant)	Project Manager / NEPA Specialist / Senior Wildlife Biologist	Technical coordination, document editing, and impact analysis for all resource topics
Mark Daniels (Consultant)	Senior Ecologist & Botanist / NEPA Specialist	Writing and compilation of the overall document.
Rafael Reyna (Consultant)	Technical Editor/Writer	Editing and Quality Control of the overall document.

5 REFERENCES, GLOSSARY AND ACRONYMS

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5.2 Glossary of Terms

Animal Unit Months (AUMs). The amount of forage necessary for the sustenance of one cow or its equivalent for a period of 1 month.

Beaver Dam Analogs. A man-made structure designed to mimic the form and function of a natural beaver dam to provide a simple, cost-effective, non-intrusive approach to stream restoration that can influence a suite of hydraulic, geomorphic and hydrologic processes in order to achieve a range of common restoration goals.

Biological Soil Crusts (BSC). BSCs are communities of living organisms on the soil surface in arid and semi-arid ecosystems. They are formed of various types of fungi, algae, lichens, and bacteria, and can hold soil together to resist wind and water erosion.

Check Dams. Temporary or permanent linear structures placed perpendicular to flows such as in drainage channels and swales to reduce flow velocities and prevent channel cutting. Check dam materials may include rock, fiber logs, triangular sediment dikes, sand bags, and other materials.

Cumulative Effects. Cumulative effects result from the incremental effect of the Original Proposed Action when added to other past, present or reasonably foreseeable future actions, regardless of who is taking the action.

Direct, Indirect Effects. Direct Effects are those occurring at the same time and place as the triggering action. Indirect effects are those caused by the action, but that occur at a later time, or at a distance from the triggering action.

Defensible Fire Space (DFS). A designated band of land managed to reduce risk of wildfire from reaching private lands or other areas where fire may impact human resources.

Ecological Site. The basic component of a land-type classification system that describes ecological potential and ecosystem dynamics of land areas, based on specific soil and physical characteristics that differ from other areas in their ability to produce a distinctive kind and amount of vegetation, and their ability to respond similarly to management actions and natural disturbances.

Fire Regime Condition Class (FRCC). Describes the degree of departure for vegetation from reference conditions, with Condition Class 3 representing the greatest degree of departure.

Fire Tolerant Species. A fire tolerant tree species is one that can withstand fire to a certain intensity or frequency. A fire intolerant species readily succumbs to a fire, and usually has lots of limbs and branches that carry fire in to the tops of trees where living needles are burned, causing the tree to die.

Fuels. Fuels include both living and dead plants, as well as wood already lying on the ground that is capable of burning. High fuel loads can contribute to hot, destructive fires.

Gully Plug. See definition of check dam.

Healthy Forest Restoration Act. On December 3, 2003, President Bush signed into law the Healthy Forest Restoration Act of 2003 to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. See a summary of the law at https://www.forestsandrangelands.gov/resources/overview/hfra-implementation12-2004.shtml.

Impaired. A term used to describe a water body such as a stream or lake that violates one or more state or federal water quality standards (such as too much of a particular microorganism or heavy metal).

Ladder Fuels. Ladder fuels are those fuels that extend from the ground and lower tree branches into the tree canopy. Ladder fuels, like surface fuels, help a fire spread more quickly, causing greater resource damage and increasing firefighter risk.

Lek. Area in which a male greater sage-grouse struts to attract females.

Mastication. A mechanical vegetation treatment method that uses tracked or wheeled machinery to convert trees into small pieces (e.g., wood chips), in the process creating canopy openings, redistributing fuel from the canopy to the surface, converting large diameter to small diameter fuels, and covering the ground with piles of woody debris.

National Fire Plan (NFP). The NFP provides national direction for hazardous fuels reduction. This direction emphasizes measures to reduce the risk to communities and the environment. The primary elements applicable to the Project are to: 1) improve prevention and suppression efforts; 2) reduce hazardous fuels; 3) restore fire-adapted ecosystems.

Potential Vegetation. The plant community that one would expect to be found at a site that has not been significantly disturbed (by humans or human-related activities such as grazing) from its natural state.

Visual Resource Management (VRM) system. A system used by various federal land management agencies to inventory and manage visual resources on the lands they administer.

Wildland Urban Interface. The area where housing and other development comes into contact with undeveloped land managed for wildland resources.

5.3 List of Acronyms

ARMPA	Utah's Greater Sage-Grouse Approved Resource Management Plan Amendment
ARPA	Archaeological Resources Protection Act
ARRWA	America's Red Rock Wilderness Act
ARS	Agricultural Research Service
BLM	Bureau of Land Management
BSC	Biological Soil Crusts
CAA	Clean Air Act
CCARM	Color County Adaptive Resource Management Plan
CFR	Code of Federal Regulations
CO	Carbon monoxide
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FMP	Fire Management Plan
FMU	Fire Management Unit
FONSI	Finding of No Significant Impact
FRCC	Fire Regime Condition Class
GSENM	Grand Staircase-Escalante National Monument
GRSG	Greater Sage-Grouse
HUC	Hydrologic Unit Category
ID	Interdisciplinary
IDT	Interdisciplinary Team
KFO	Kanab Field Office
LUP	Land Use Plan
LWC	Lands with Wilderness Character
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NFP	National Fire Plan
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NO_x	Nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
OHV	Off Highway Vehicle
Pb	Lead
PHMA	Priority Habitat Management Area
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
PM_{10}	Particulate Matter less than 10 microns in diameter
RFFA	Reasonably Foreseeable Future Action
ROD	Record of Decision
SGMA	Sage-Grouse Management Area
SHPO	State Historic Preservation Office

SLRU	Sensitivity Level Rating Unit
SO_x	Sulfur oxides
SQRU	Scenic Quality Rating Unit
SRP	Special Recreation Permit
SUSA	Southern Utah Support Area
TCP	Traditional Cultural Property
TGA	Taylor Grazing Act
UDWR	Utah Division of Wildlife Resources
USDA	United States Department of Agriculture
UPCD	Utah Partners for Conservation Development
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWRI	Utah's Watershed Restoration Initiative
VEIS	Final Vegetation Treatments Using Herbicide Programmatic EIS
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WA	Wilderness Area
WSA	Wilderness Study Area
WUI	Wildland Urban Interface

APPENDIX A

PROJECT AREA MAPS

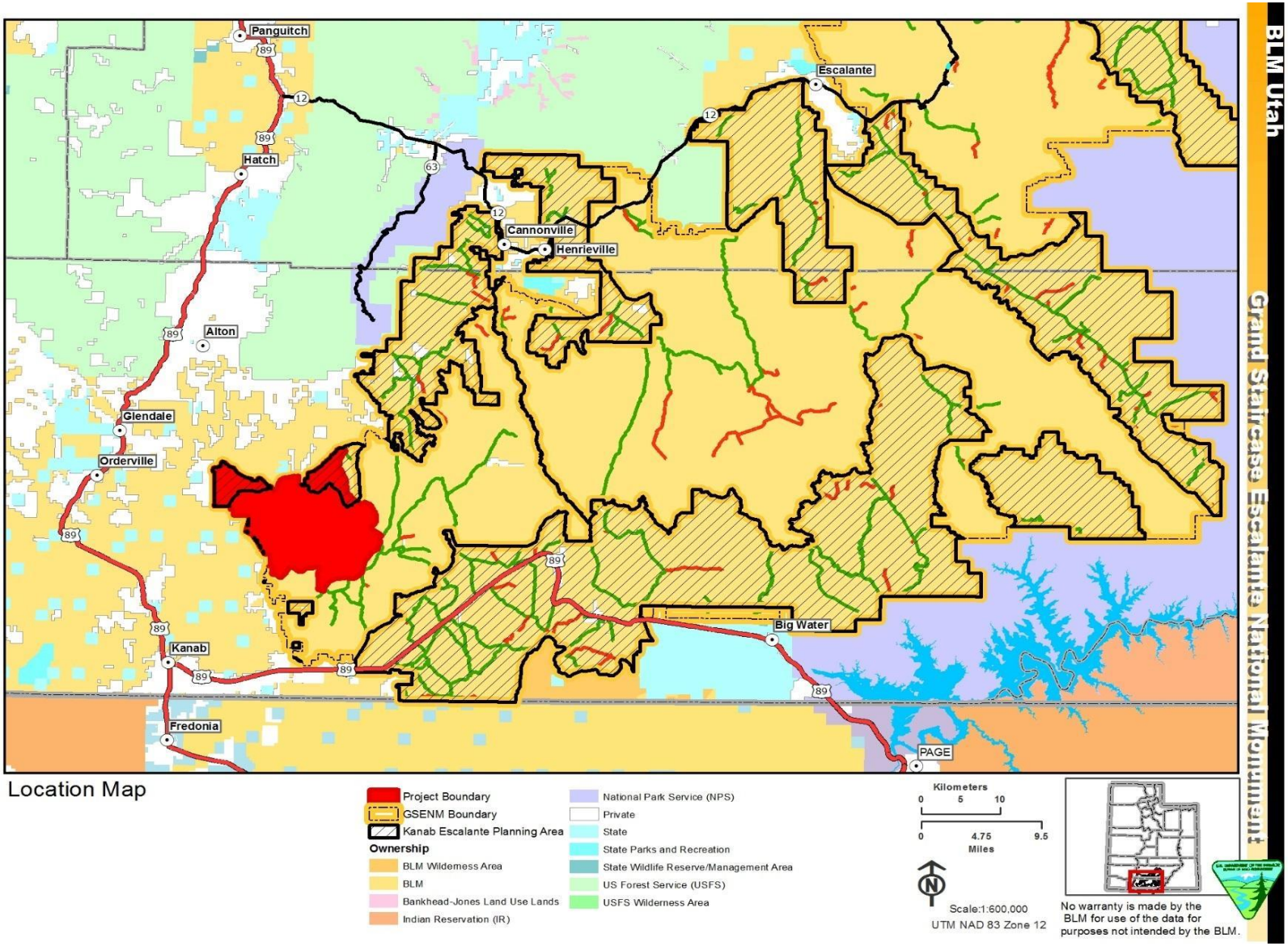


Figure A1. Project Location Map

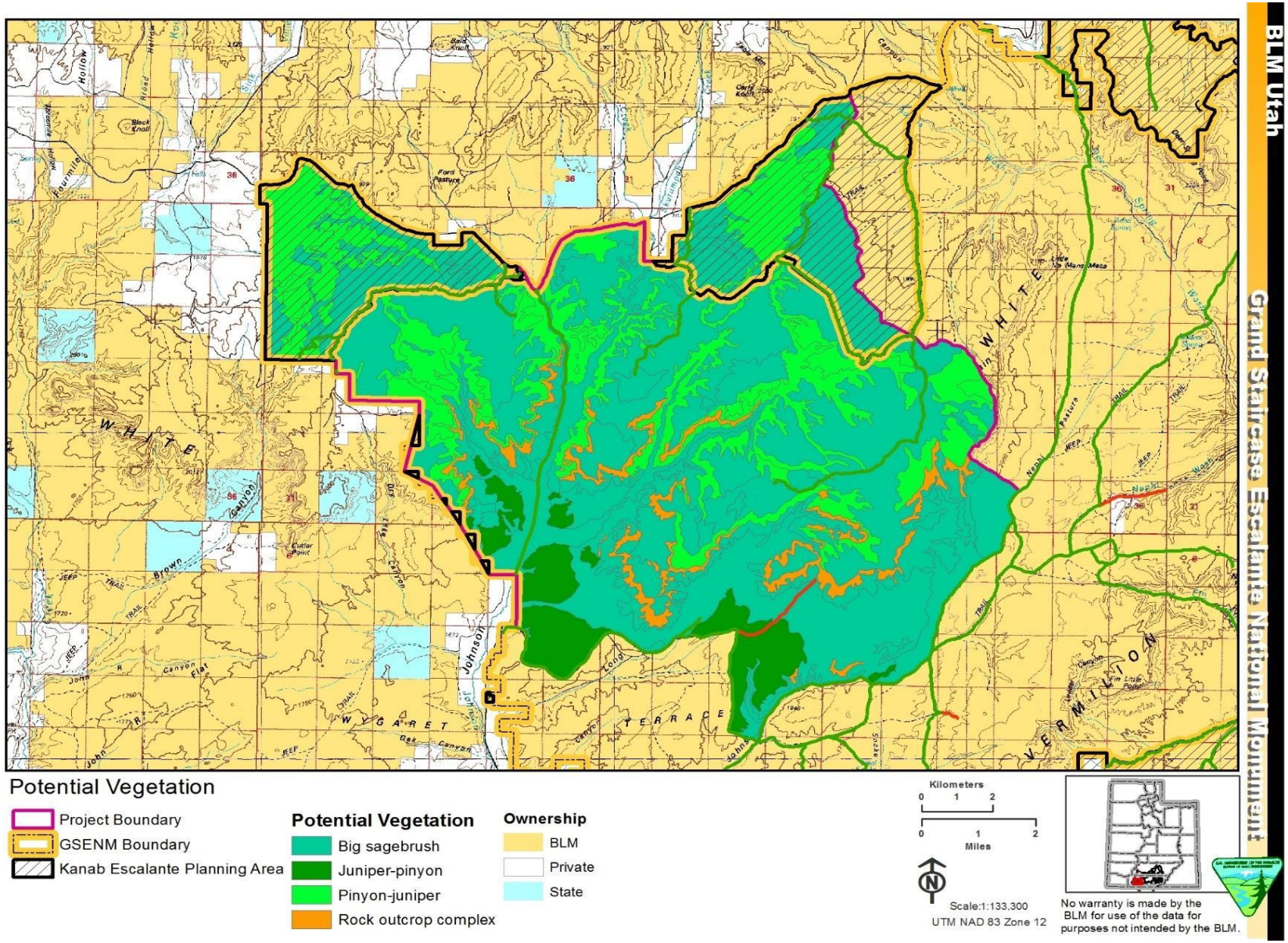


Figure A2. Project Area Potential Vegetation

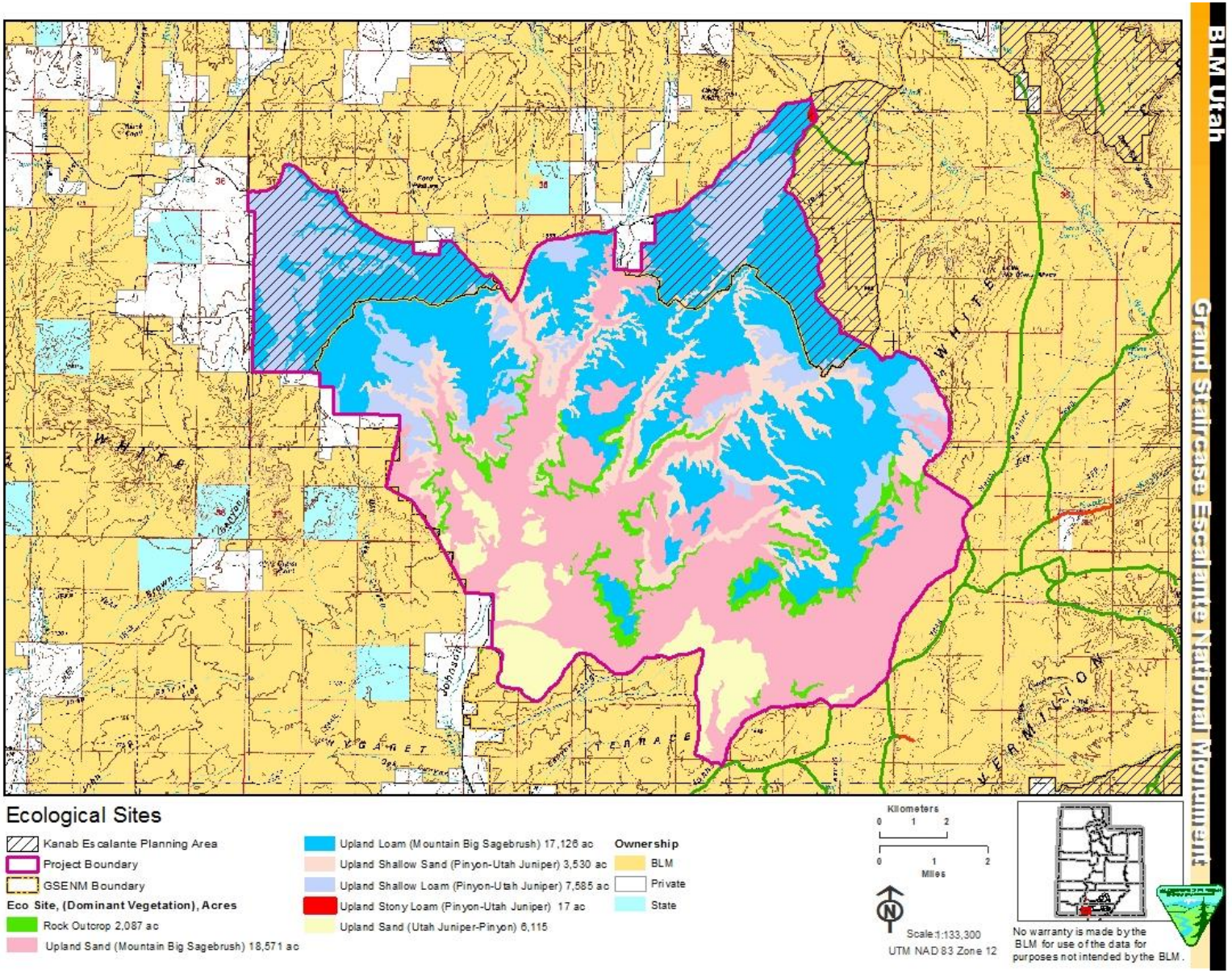


Figure A3. Project Area Ecological Sites

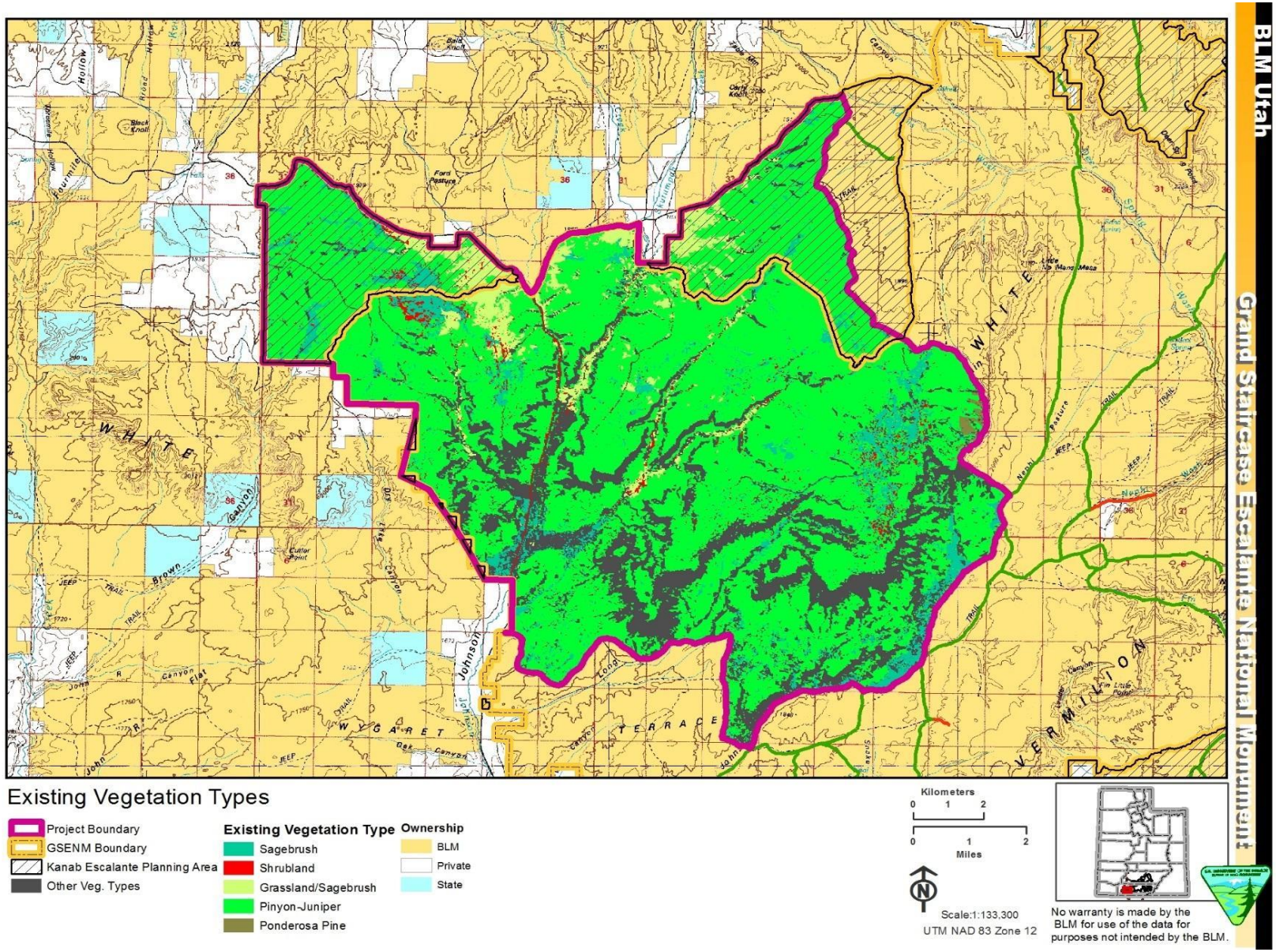


Figure A4. Project Area Existing Vegetation Types

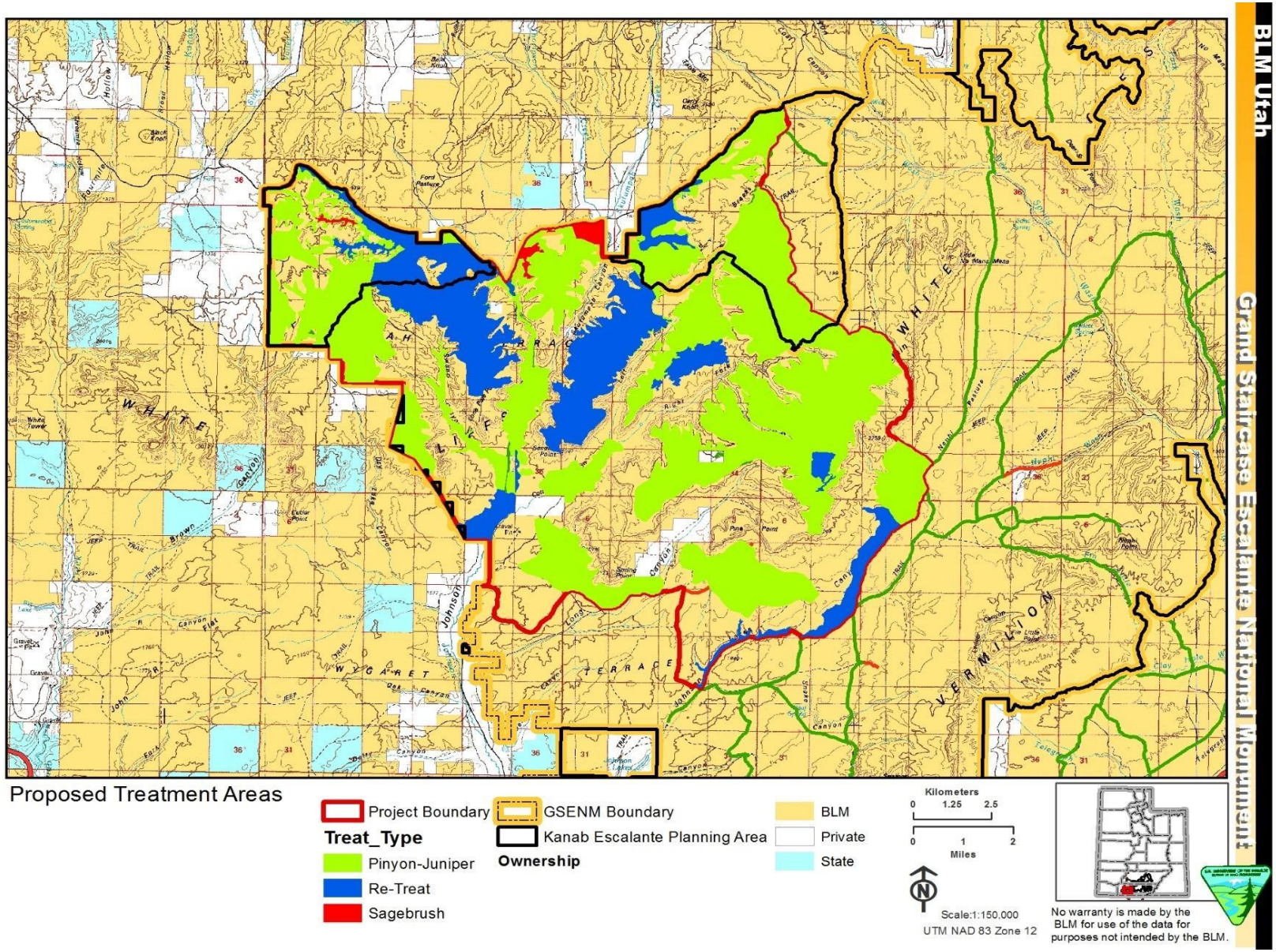


Figure A5. Project Proposed Treatment Areas

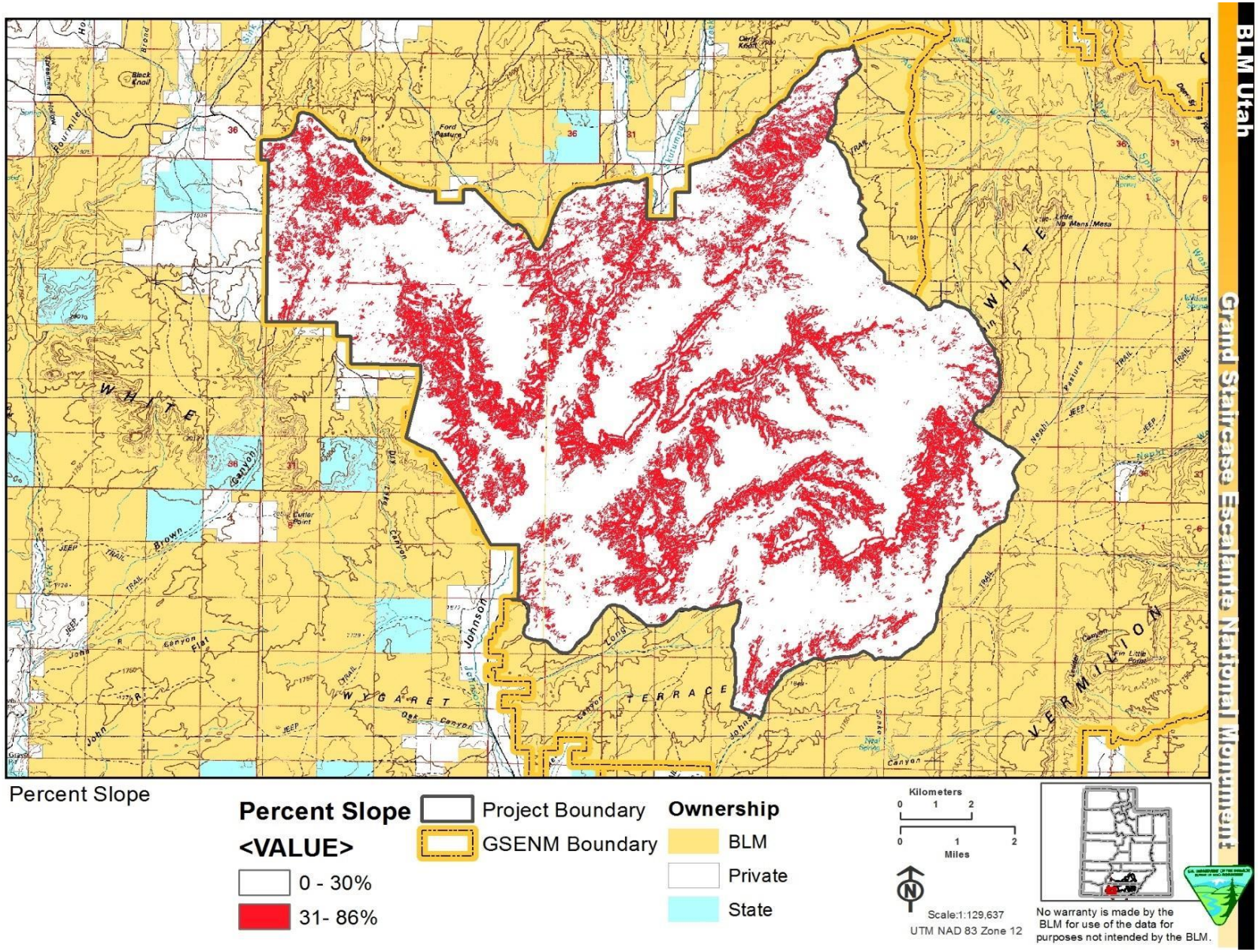


Figure A6. Project Area Percent Slope

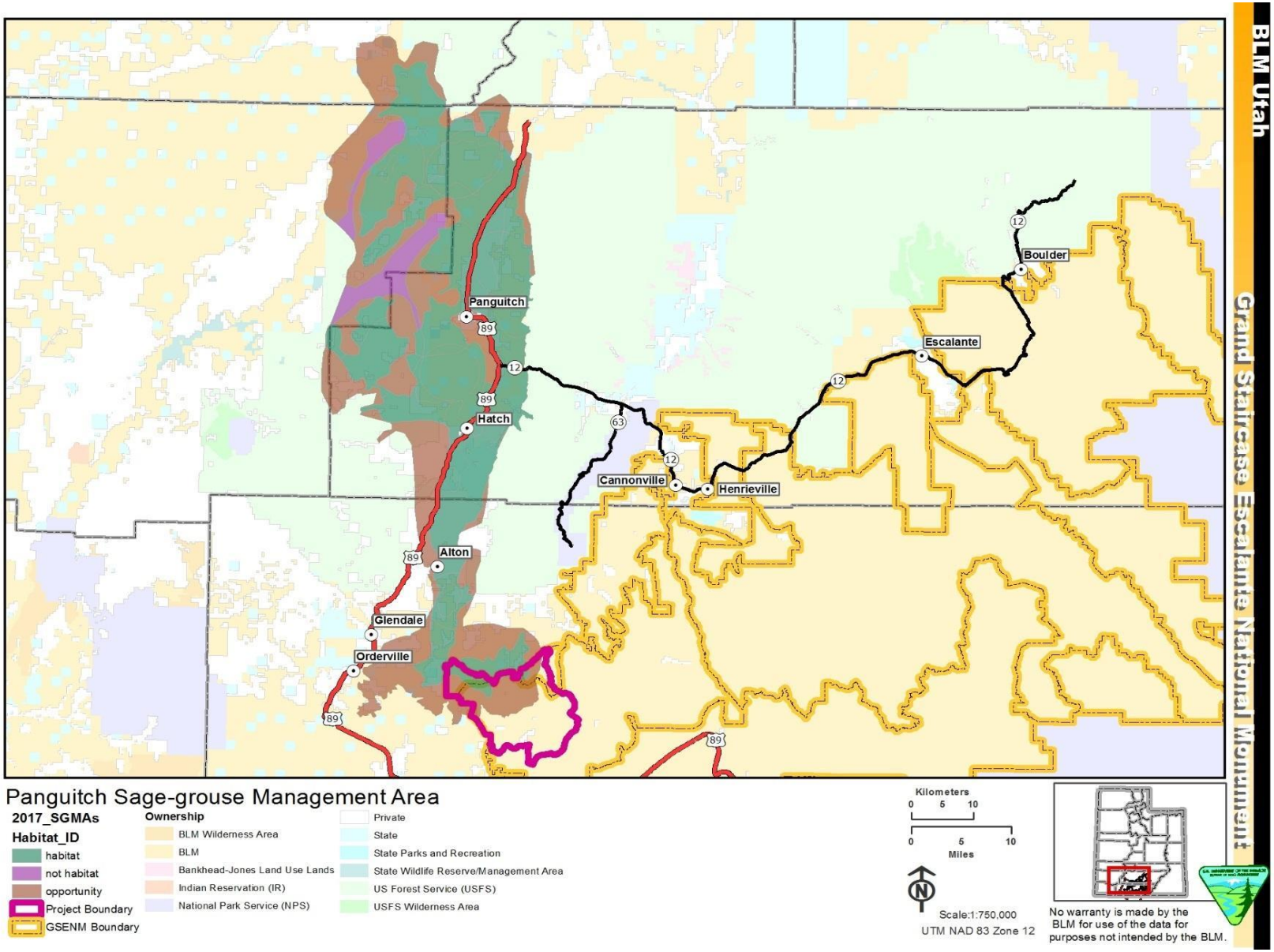


Figure A7. Panguitch Sage-grouse Management Area

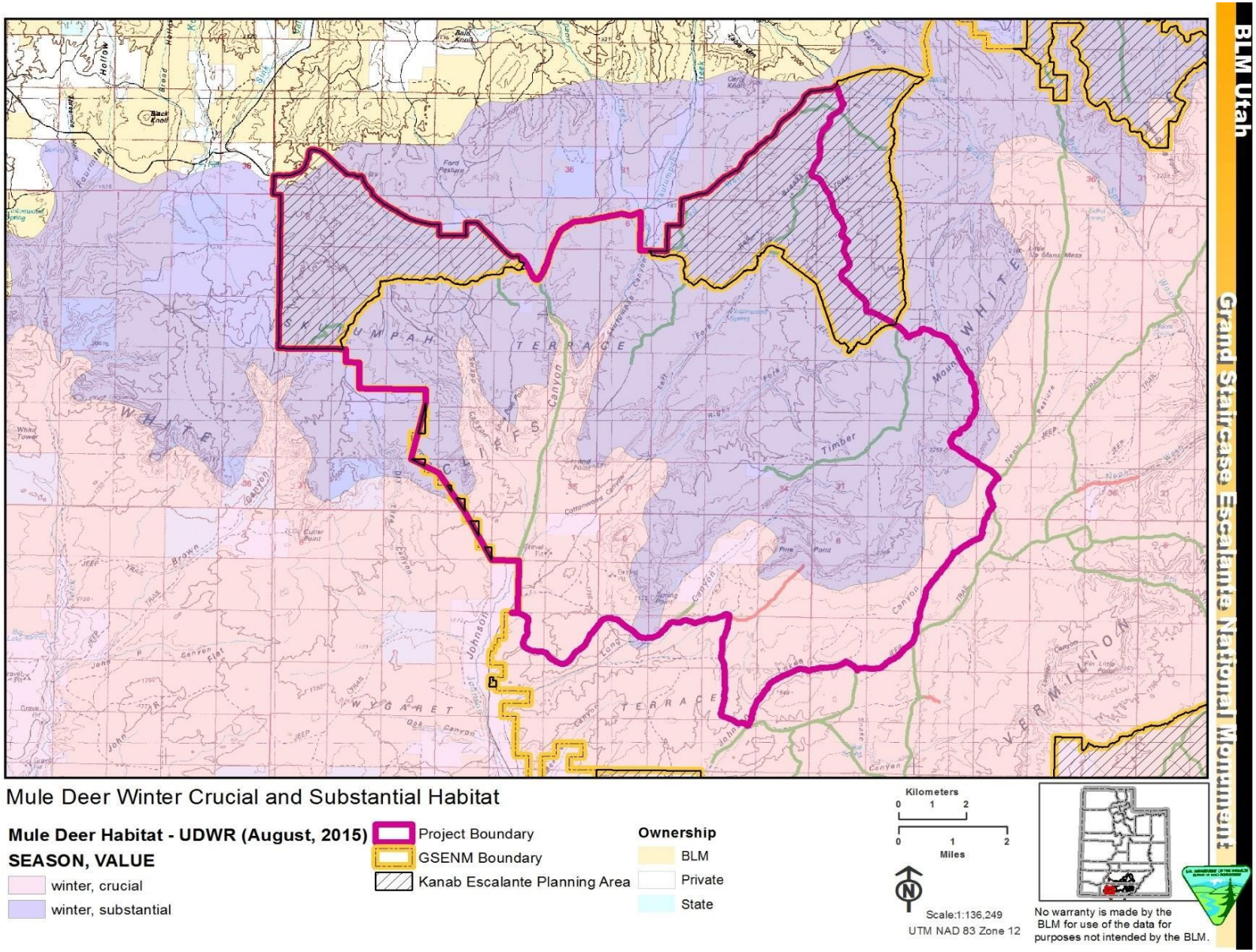


Figure A8. Project Area Mule Deer Winter Crucial and Substantial Habitat

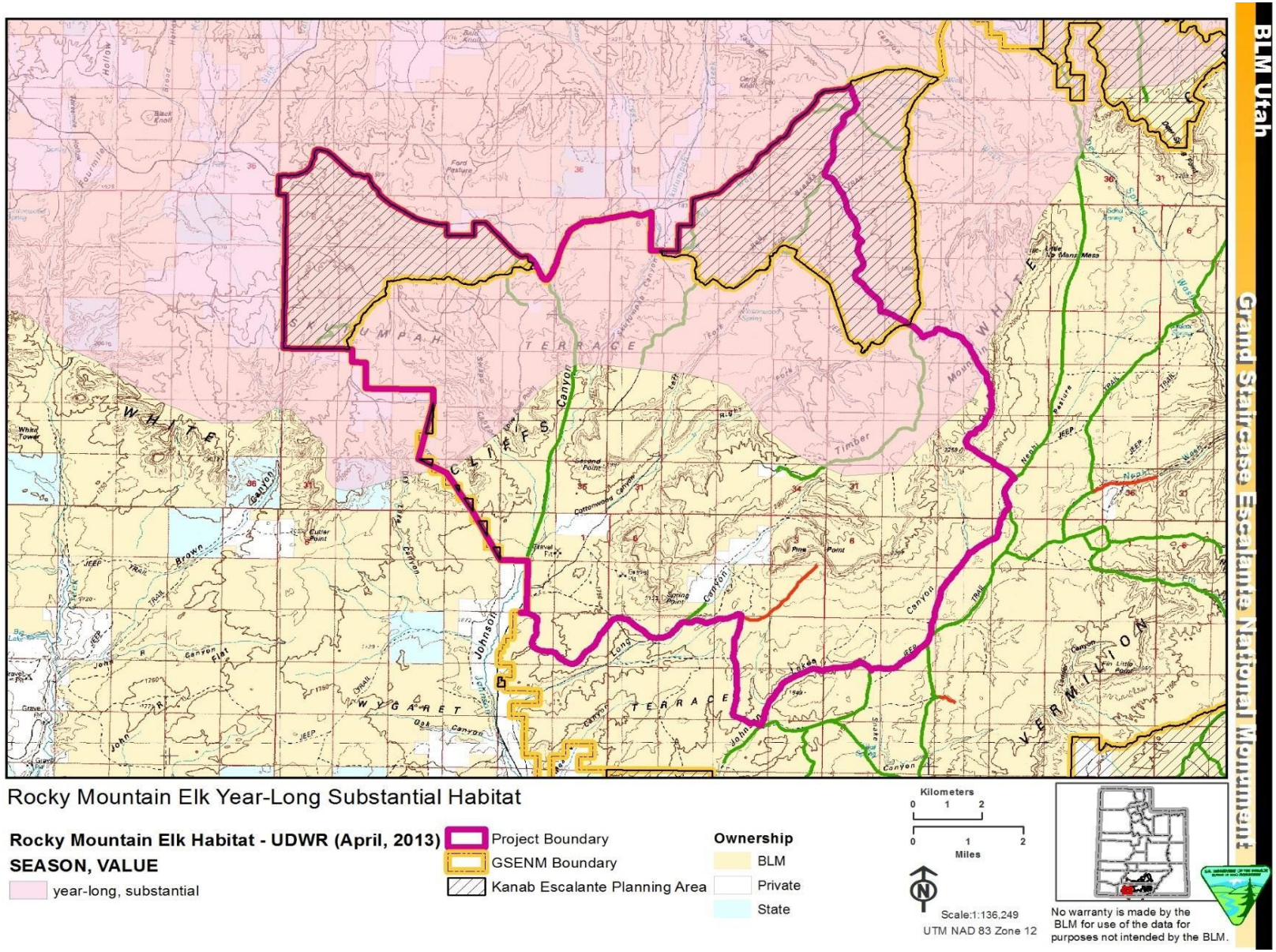


Figure A9. Project Area Rocky Mountain Elk Year-Long Substantial Habitat

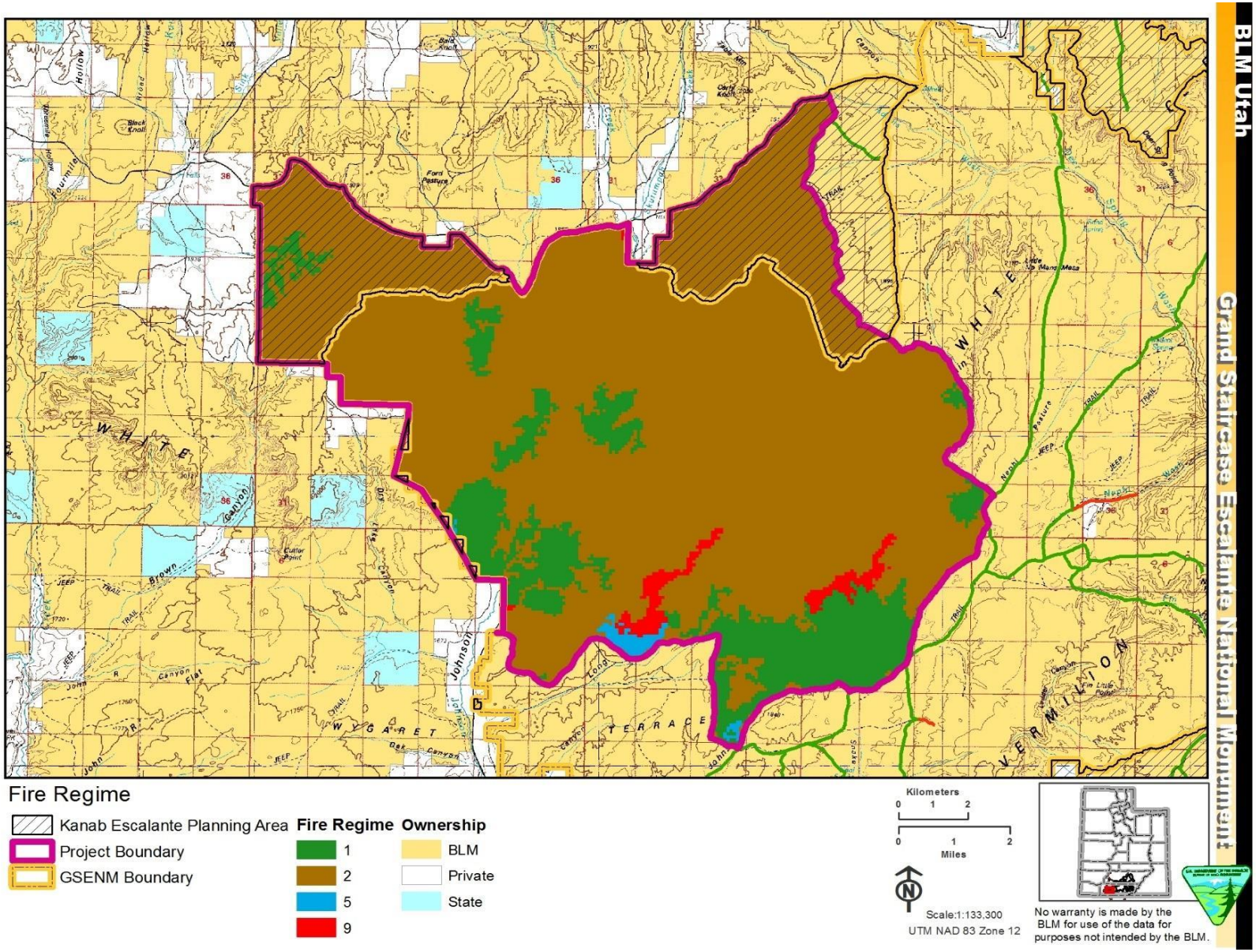


Figure A10. Project Area Fire Regime

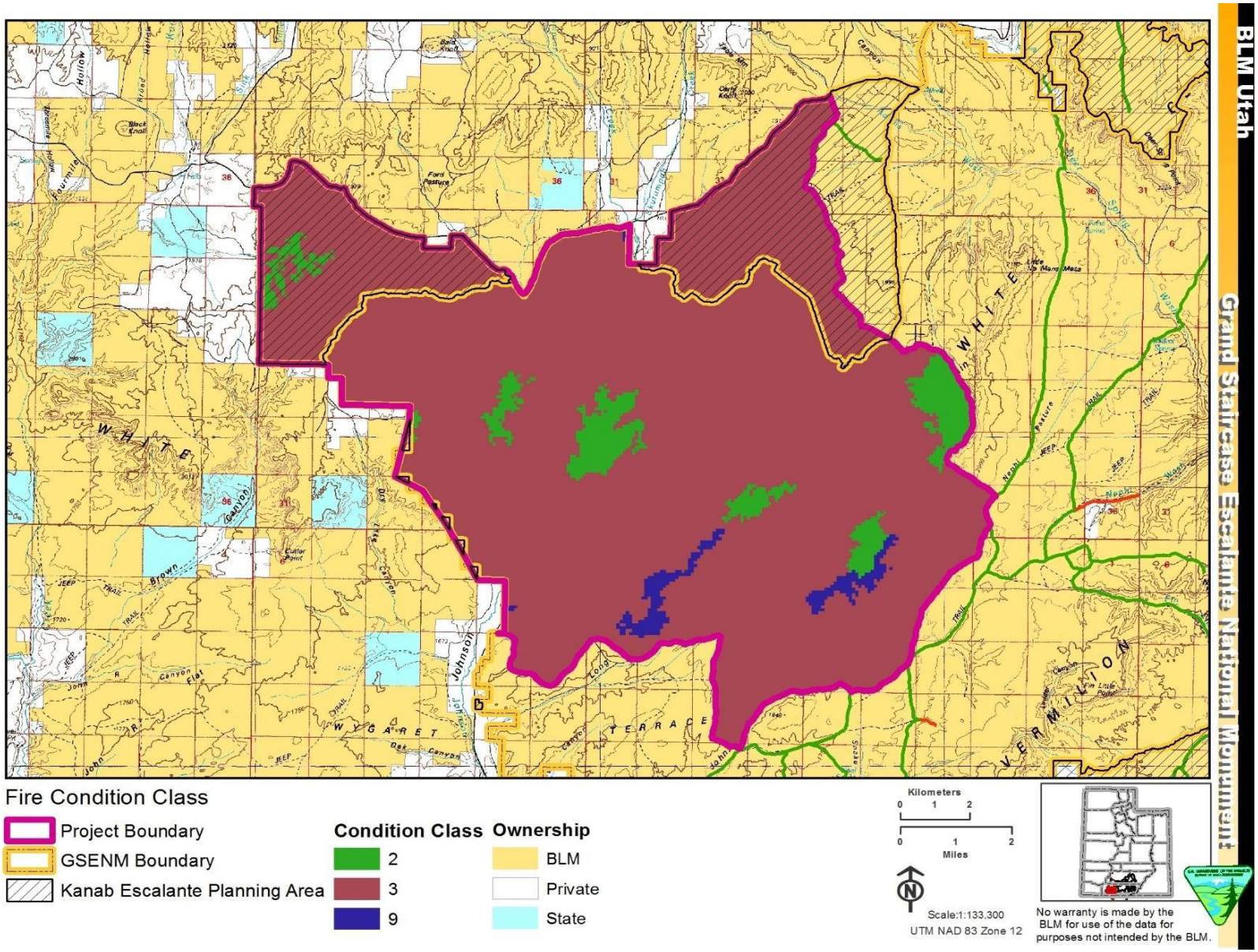


Figure A11. Project Area Fire Condition Class

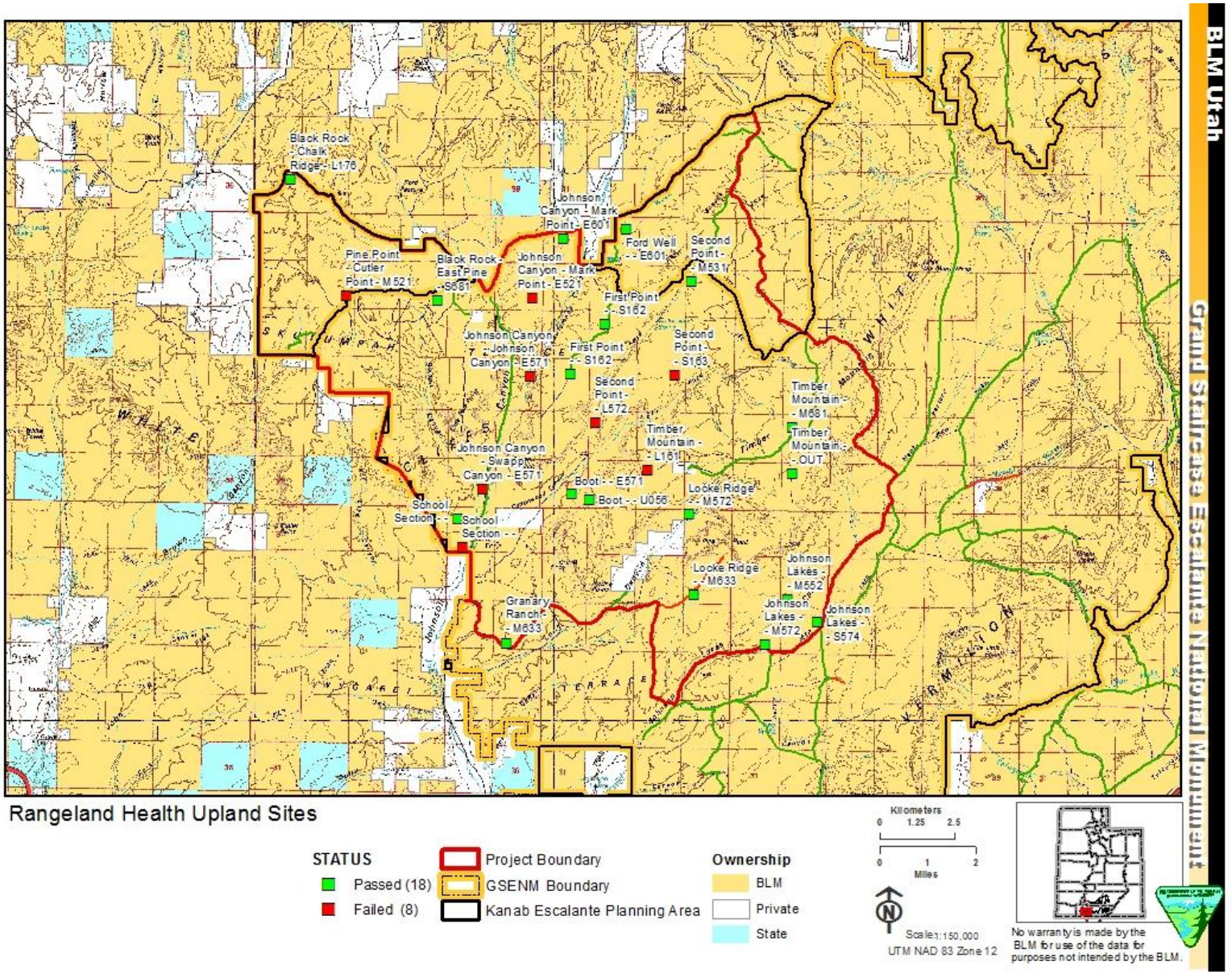


Figure A12. Rangeland Health Upland Sites

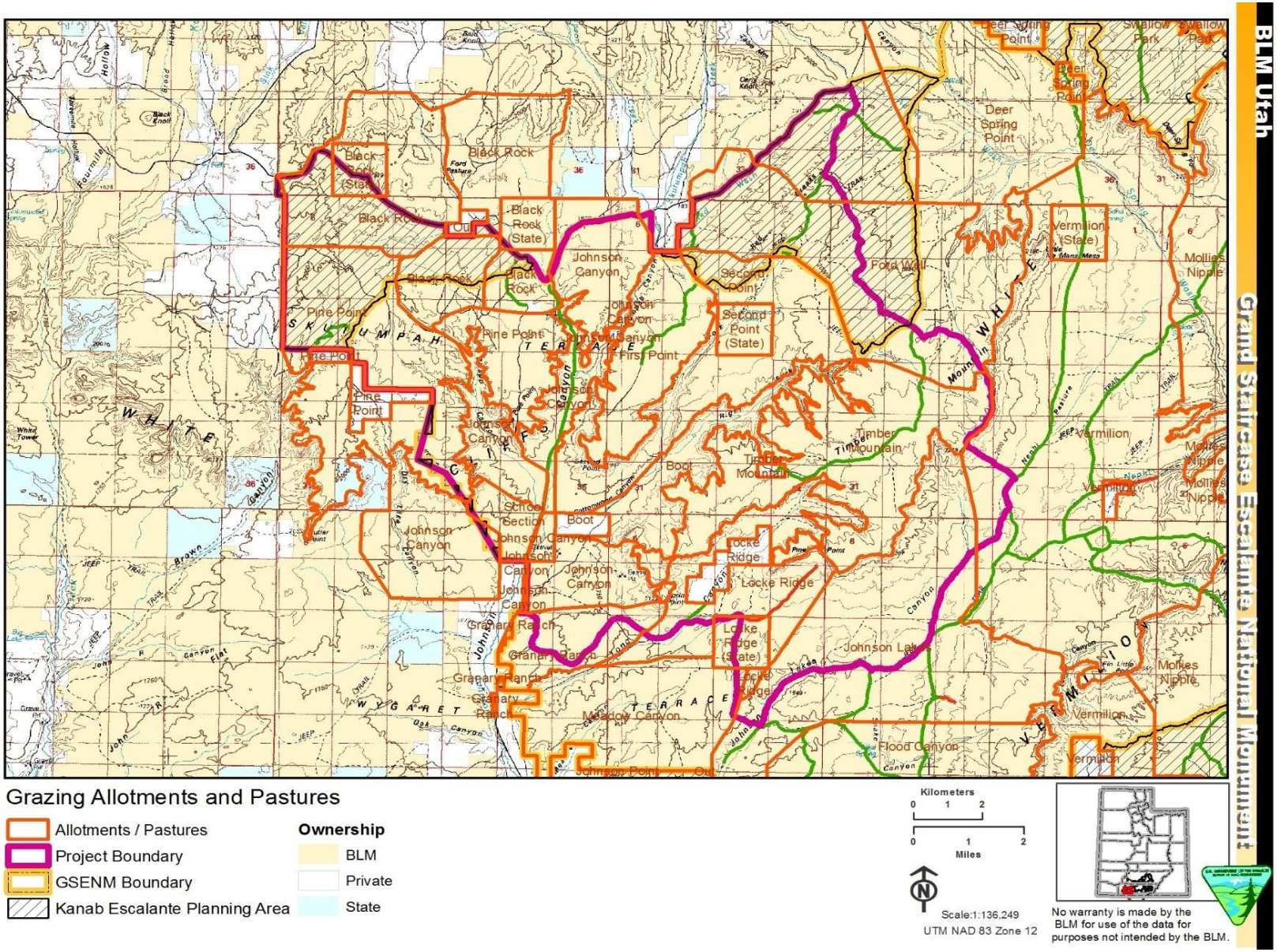


Figure A13. Project Area Grazing Allotments and Pastures

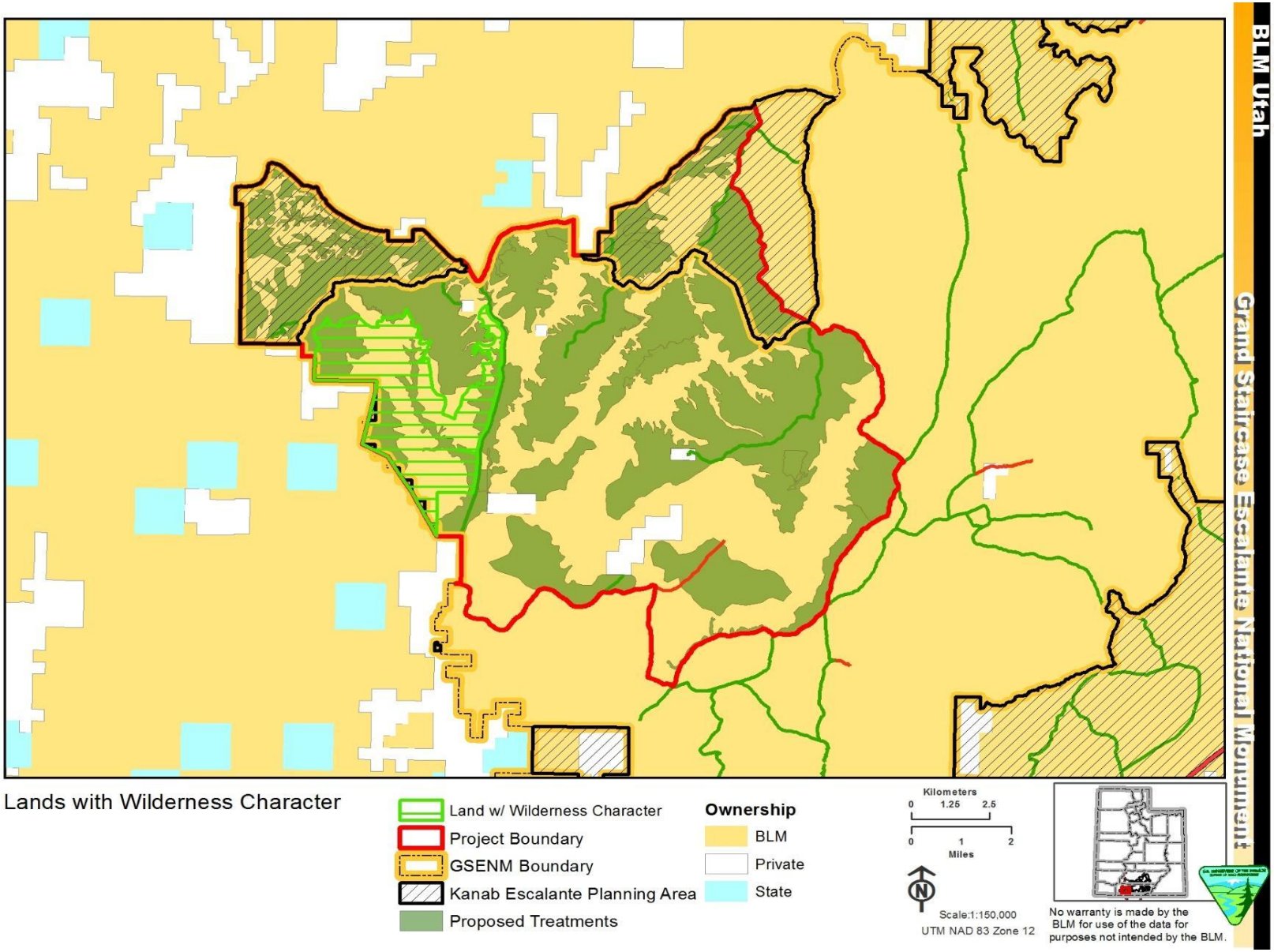


Figure A14. Lands with Wilderness Character

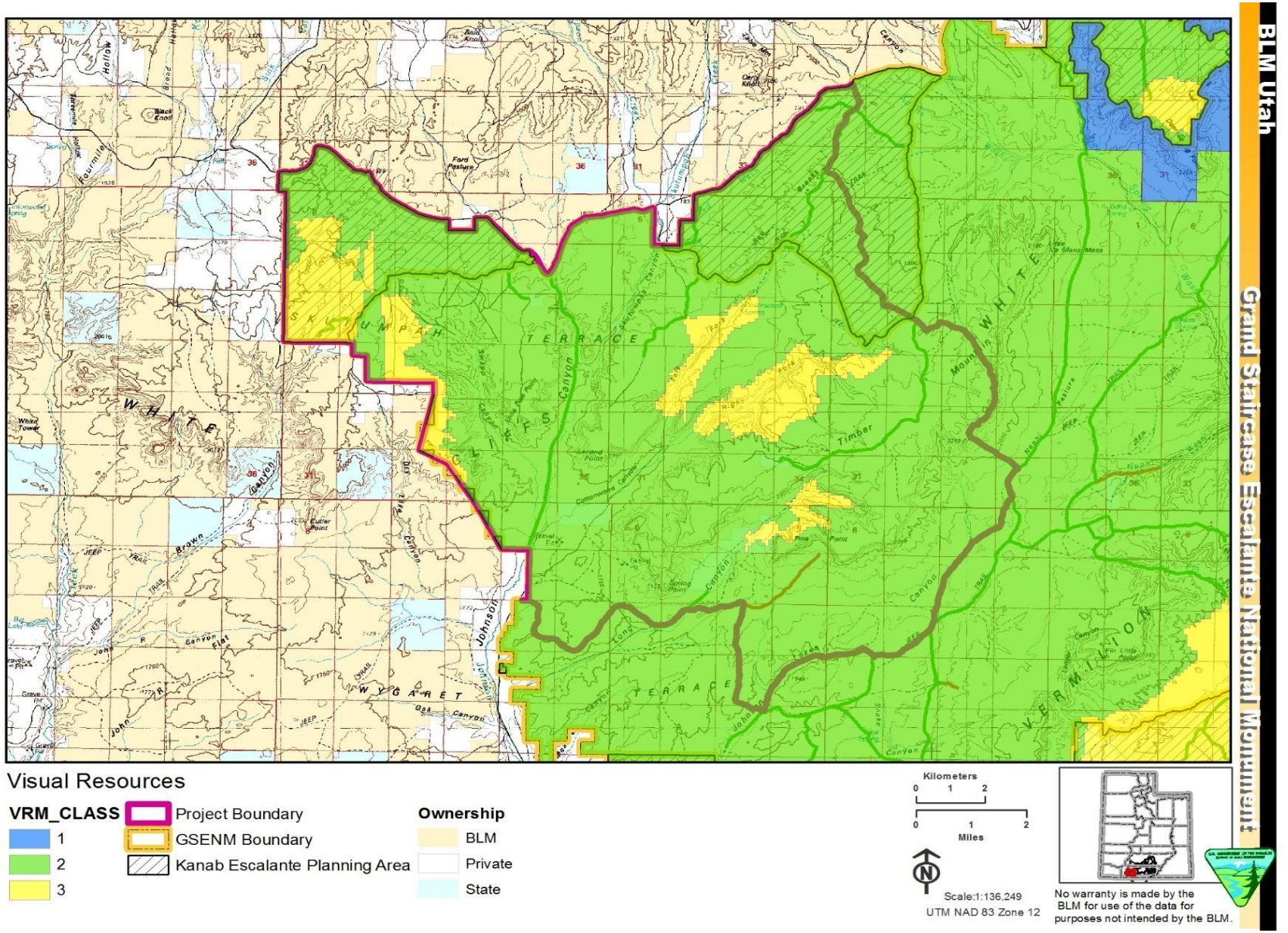


Figure A15. Project Area Visual Resources

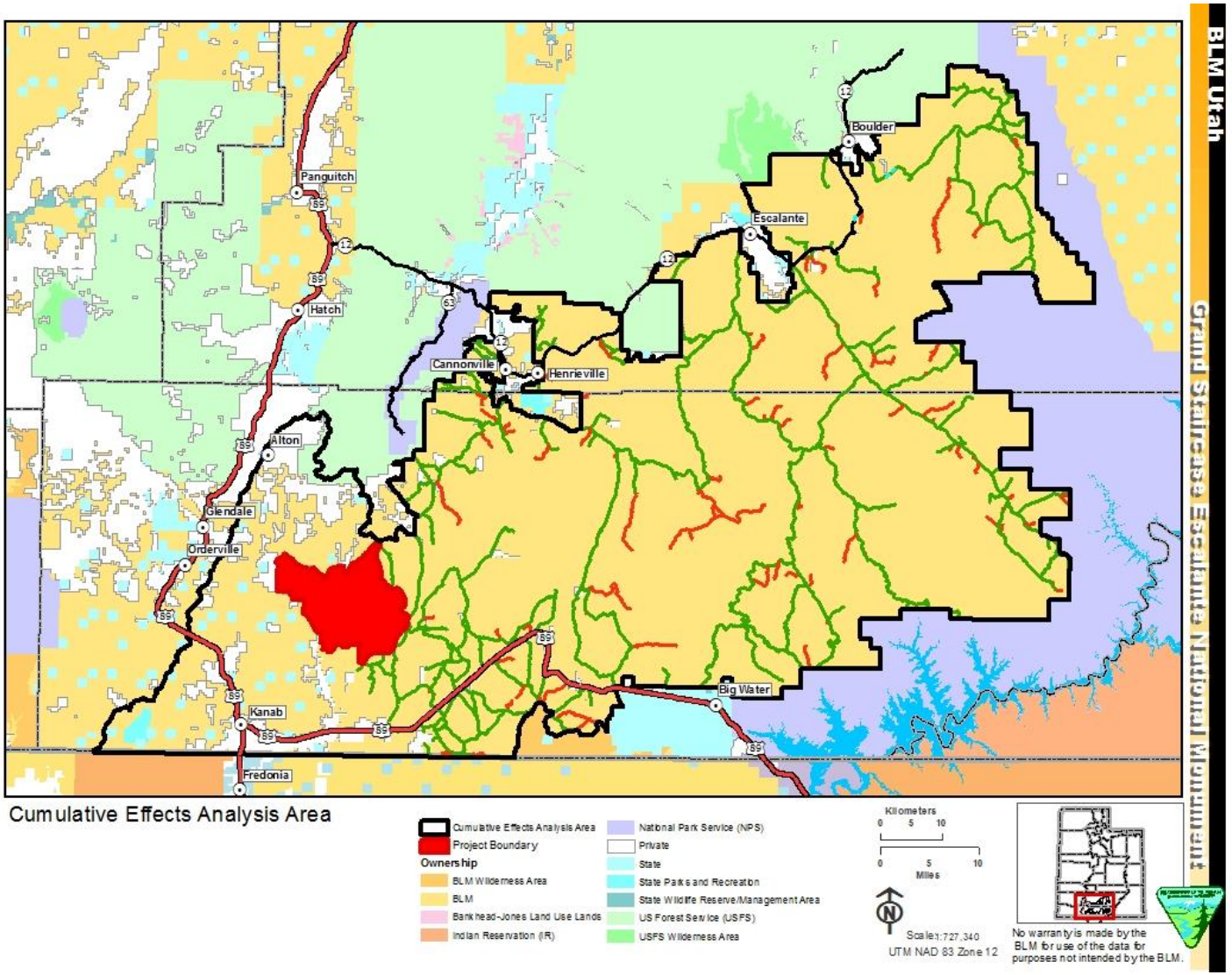


Figure A16. Cumulative Effects Analysis Area[5]

[5] The cumulative effects analysis area (CEAA) is larger than the Project area and includes the entire boundary of the GSENM merged with the HUC 8 watershed (Kanab Creek) within the state of Utah. The visual resource CEAA is unique and described in Section 3.5.12 of this EA.

APPENDIX B

FIRE REGIME CONDITION CLASS DEFINITION

Condition Class	Fire Regime	Example Management Options	Examples of Key Ecosystem Component Susceptibility to Changing Fire Regime Condition Classes			
			Species composition and structure	Invasion by non-native species	Smoke production hydrology, and Soils	Insects and disease
Condition Class 1	Fire regimes are within the natural (historical) range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition, structure, and pattern) are intact and functioning within the natural (historical) range.	Where appropriate, these areas can be maintained within the natural (historical) fire regime by treatments such as fire use.	Species composition and structure are functioning within their natural (historical) range at both patch and landscape scales.	Non-native species are currently not present or present in limited extent. Through time or following disturbance sites are potential vulnerable to invasion by non-native species.	Functioning within their natural (historical) range.	Insect and disease populations functioning within their natural (historical) range.
Condition Class 2	Fire regimes have been moderately altered from their natural (historical) range. Risk of losing key ecosystem components is moderate. Fire frequencies have departed from natural frequencies by one or more return intervals (either increased or decreased). This result in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation and fuel attributes have been moderately altered from their natural (historical) range.	Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the natural fire regime.	Species composition and structure have been moderately altered from their historical range at patch and landscape scales. For example: Grasslands – Moderate encroachment of shrubs and trees and/or invasive exotic species. Shrublands – Moderate encroachment of trees, increased shrubs, or invasive exotic species. Forestland/Woodland – Moderate increases in density, encroachment of shade tolerant tree species, or moderate loss of shade intolerant tree species caused by fire exclusion, logging, or exotic insects or disease. Replacement of surface shrub/grass with woody fuels and litter.	Populations of non-native invasive species may have increased, thereby increasing the potential risk for these populations to expand following disturbances, such as wildfires.	Have been moderately altered from their natural (historical) range. Water flow typically less. Smoke and soil erosion following fire typically greater.	Insect and disease population have been moderately altered from their natural (historical) range.
Condition Class 3	Fire regimes have been substantially altered from their natural (historical) range. The risk of losing key ecosystem components is high. Fire frequencies have departed from natural frequencies by multiple return intervals. Dramatic changes occur to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been substantially altered from their natural (historical) range.	Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the natural fire regime.	Species composition and structure have been substantially altered from their historical range at patch and landscape scales. For example: Grasslands – High encroachment and establishment of shrubs, trees, or invasive exotic species. Shrublands – High encroachment and establishment of trees, increased shrubs, or invasive exotic species. Forestland/Woodland – High increases in density, encroachment of shade tolerant tree species, or high loss of shade intolerant tree species caused by fire exclusion, logging, or exotic insects or disease.	Invasive species may be common and in some cases the dominant species on the landscape. Any disturbance will likely increase both the dominance and geographic extent of these invasive species.	Have been substantially altered from their historical range.	Insect and disease population have been substantially altered from their natural (historical) range. Typically higher mortality or defoliation.

APPENDIX C

INTERDISCIPLINARY TEAM CHECKLIST

Project Title: Skutumpah Terrace Sagebrush Steppe Enhancement Project
NEPA Log Number: DOI-BLM-UT-0300-2017-0003-EA
Project Leader: Cameron McQuivey

DETERMINATION OF STAFF:

NP = not present in the area impacted by the proposed or alternative actions
NI = present, but not affected to a degree that detailed analysis is required
PI = present with potential for impact that needs to be analyzed in detail
NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form.
The rationale column may include NI and NP discussions.

RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)

Determi-nation	Resource	Rationale for Determination*	Signature	Date
PI	Air Quality (Bybee)	The Proposed Action could result in impacts to air quality. Dust generated from wind due to bare ground would cause particulates to enter the air and affect air quality. Prescribed fire would also affect air quality. Smoke, ash and particulates generated from fire would enter the air and dissipate within a few days.	/s/ J. Bybee	7/23/2018
NP	Areas of Critical Environmental Concern (Amstutz)	There are no Areas of Critical Environmental Concern designated within Grand Staircase-Escalante National Monument.	/s/ B Amstutz	7/31/2018
PI	Biological Soil Crusts (Brinkerhoff)	The Proposed Action could have impacts on the existing biological soil crusts. Depending on the method of treatment, soil type and the presence of soil crusts will depend on the impacts that could occur.	/s/ R. Brinkerhoff	8/2/2018
NP	BLM Natural Areas (Amstutz)	Natural Areas are designated within GSENM but are not located within the Project area and would not be impacted by the Proposed Action.	/s/ B Amstutz	8/2/2018
PI	Cultural Resources (Zweifel)	Appropriate NHPA Section 106 clearance and SHPO consultation will be required prior to Project implementation. Historic Properties will be avoided during implementation; if avoidance is not possible, appropriate mitigation measures will be implemented.	/s/ M. Zweifel	7/31/2018
NI	Greenhouse Gas Emissions/Climate Change/Carbon Sequestration (Bybee), (Vernon)	Original: The Proposed Action would not affect greenhouse gas emissions to a degree of detailed analysis. Mechanical tools will be used to implement most of the treatments and some greenhouse gas emissions will be generated. The emissions generated from the use of these tools will disperse quickly and be unmeasurable. Revised: The Proposed Action would not affect greenhouse gas emissions to a degree of detailed analysis. Mechanical tools will be used to implement most of the treatments resulting in some greenhouse gas emissions. Emissions are	/s/ J. Bybee /s/ E. Vernon	7/23/2018 12/17/2018

Determi-nation	Resource	Rationale for Determination*	Signature	Date
		anticipated to be below the EPA GHG reporting limit of 25,000 tons per year. Short-term loss of carbon storage will occur due to biomass removal, but most evidence suggests that fuel treatments can reduce carbon-loss from wildland fire emissions over the long term. Soils store over 2/3 of carbon on Federal lands in Utah and reduction in biomass carbon storage from the Proposed Action will be small compared to the total land sequestration capability in the state. Net changes to carbon storage are not quantifiable as it varies based on vegetation type, vegetation density, vegetation regrowth, weather, and other factors.		
NI	Environmental Justice	As defined in EO 12898, minority, low-income populations and disadvantaged groups may be present within the county and may use the analysis area. Individual Proposed Actions within the analysis area would not cause any disproportionately high and adverse effects on minority or low-income populations. (Individually or collectively). Members of the public would still use the analysis area.	/s/ D. Backer	8/3/2018
NP	Farmlands (Prime or Unique) (Backer)	Prime farmland is described as farmland with resources available to sustain high levels of production. In Utah, it normally requires irrigation to make prime farmland. In general, prime farmland has a dependable water supply, a favorable temperature and growing season, acceptable levels of acidity or alkalinity, an acceptable content of salt and sodium, and few or no rocks. Unique farmland in Utah is primarily in the form of orchards. Based on these definitions, no prime or unique farmlands exist within the Monument. (see NRCS 1997 Results - Cropland Utah accessed at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ut/technical/dma/nri/?cid=nrcs141p2_034092 on 2/6/2014.)	/s/ D. Backer	8/3/2018
PI	Fish and Wildlife Excluding USFWS Designated Species (Tolbert/McQuivey)	The Proposed Action could have impacts, both positive and negative to wildlife species. Species dependent upon the sagebrush steppe ecosystem are expected to see a positive impact in habitat condition and availability. Conversely, species that thrive in pinyon-juniper woodlands are expected to see slight to moderate population declines as this type of habitat would decline. Migratory bird species would not see noticeable direct impacts due to the timing of the Projects (Fall/Winter). Indirectly, bird species would need to adapt to changes in habitat condition and availability.	/s/ C.McQuivey	7/23/18
NI	Floodplains (Bradshaw)	Impacts to floodplains are not anticipated.	/s/K. Bradshaw	7/30/2018
PI	Fuels/Fire Management (Bate)	The Proposed Action will most likely increase short term fuel loads. Long Term the Proposed Action will decrease fuel within the Project area.	/s/A. Bate	8/1/18
NI	Geology / Mineral Resources/Energy Production (Titus)	Vegetation treatments as are outlined in the Proposed Action, which are entirely on outcrops of Carmel and Navajo formations, would not affect scenic or economic geology values. Treatments are confined to flat, vegetated areas with poor outcrops. The actions are temporary and should not affect commercial production of solid or fluid materials. No energy corridors would be impacted.	/s/ Alan Titus	7/31/2018

Determi-nation	Resource	Rationale for Determination*	Signature	Date
PI	Hydrologic Conditions (Bradshaw)	Hydrologic conditions will be altered by vegetation treatments. The degree of alteration depends on the type of treatment used, the amount of vegetation removed, and the time it takes for vegetation to reestablish. Successful treatments are expected to improve hydrologic conditions over the long-term by stabilizing upland soils, reducing runoff and increasing infiltration.	/s/K. Bradshaw	7/30/2018
PI	Invasive Species/Noxious Weeds (EO 13112) (Brinkerhoff)	The Proposed Action has the potential to increase the threat of invasive/noxious weeds. The equipment will be weed washed prior to arriving on site to mitigate any new weed species. After treatments are implemented there could be a fluctuation of annuals (cheatgrass) but after the site has established is will be more resilient to invasive/noxious weeds.	/s/ R. Brinkerhoff	8/2/18
NI	Lands/Access (Foley)	Proposed Action as described would have no impact on access, land tenure, or potential future uses, including renewable energy. As with all Projects on public land, work should take care to preserve survey markers, bearing trees, and witness corners if present. There are very few realty-related valid existing rights in the Project area. Work should take care to avoid any above-ground items, such as support poles, power lines, junction boxes, and right-of-way markers. These are primarily along the edge of main roadways in the Project area. Recommend coordinating with South Central prior to the start of work for its buried fiber optic line along Johnson Canyon and Skutumpah Roads authorized under UTU-91590.	/s/ Mark Foley	07/11/2018
PI	Livestock Grazing (Stewart)	The Proposed Action will most likely have short term impacts to livestock grazing, in that the treatment areas will need to be rested during restoration and for two growing seasons after seeding. Long term impacts would most likely benefit livestock grazing including but not limited to better livestock distribution, based on more available forage and improved RLH conditions on the allotment.	/s/ S. Stewart	7/23/18
PI	Native American Religious Concerns (Zweifel)	Appropriate NHPA Section 106 clearance and SHPO consultation will be required prior to Project implementation. Historic Properties will be avoided during implementation; if avoidance is not possible, appropriate mitigation measures will be implemented. Native American consultation will also need to be initiated during Project planning and design of any necessary mitigation strategies.	/s/ M. Zweifel	7/31/18
NI	Paleontology (Titus)	Treatment methods include potential extensive ground disturbance, but the Proposed Action is limited to poorly exposed outcrops of Navajo SS and Carmel Formation, neither of which are likely to produce significant fossils affected by the Project.	/s/ Alan Titus	7/31/2018
PI	Rangeland Health Standards (Stewart)	Long term, Proposed Action would most likely improve Rangeland Health through the improvement of desired species within functional groups, enhanced soil stability, infiltration and improved ecological condition. Short term impacts to soils, existing vegetation and the potential for introduction of undesired species could also result from the Proposed Action.	/s/ S. Stewart	7/23/18
PI	Recreation (Amstutz)	Recreational activities and outcomes would be impacted by proposed vegetative treatments.	/s/ B Amstutz	8/2/18

Determi-nation	Resource	Rationale for Determination*	Signature	Date
NI	Socio-Economics (Backer)	Quantifiable additional or decreased economic impact to the local area would not be affected by the Proposed Action.	/s/ D. Backer	8/3/2018
PI	Soils (Bradshaw)	Soils will be altered by vegetation treatments. The degree of alteration depends on the type of treatment used, the soil type, the amount of vegetation removed, the degree of soil disturbance, the timing of the treatment, and the time it takes for vegetation to reestablish. In the short-term, there is potential for soil loss due to wind and water erosion before vegetation establishes. Once vegetation reestablishes, it is expected that soil loss due to wind and water erosion would be reduced.	/s/K. Bradshaw	7/30/2018
NP	Threatened, Endangered or Candidate Plant Species (Brinkerhoff)	There are no threatened or endangered plant species within the proposed site location. Prior to implementing Projects, a special status plant species inventory will be conducted.	/s/ R. Brinkerhoff	8/2/18
NP	Threatened, Endangered or Candidate Animal Species (McQuivey)	There are no known populations, critical habitats, or individual threatened or endangered species found within the proposed Project location.	/s/ C. McQuivey	7/23/18
NI	Wastes (hazardous or solid) (Linton)	No hazardous wastes would be generated by the Proposed Action.	/s/ T. Linton	8/3/2018
PI	Water Resources/Quality (drinking/surface/ ground) (Bradshaw)	There are potential impacts to water quality. The degree of impact depends on the type of treatment used, the soil type, the amount of vegetation removed, the degree of soil disturbance, the timing of the treatment, and the time it takes for vegetation to reestablish. There is potential for water quality degradation from sediment, salinity, and herbicides. Successful treatments are expected to improve water quality over the long-term by stabilizing upland soils. Water quantity could increase over the long-term as successful treatment would reduce runoff and increase infiltration.	/s/K. Bradshaw	7/30/2018
PI	Wetlands/Riparian Zones (Brinkerhoff)	The Proposed Action could impact the few riparian systems within the proposal and could impact the riparian systems downstream. Slowing the overland flows down and not washing out the riparian systems would have positive impacts.	/s/R. Brinkerhoff	8/2/18
NP	Wild and Scenic Rivers (Beal)	Proposed WSR are not present in the Project area	/s/ J. Beal	7/31/2018
NP	Wilderness/WSA (Beal)	WSA is not present in the Project area	/s/ J. Beal	7/31/2018
PI	Woodland/Forestry (Bate)	Pinion-Juniper trees will be removed during implementation of the Proposed Action.	/s/S. Stewart	8/1/18
PI	Vegetation Excluding USFWS Designated Species (Brinkerhoff)	The proposed Project will have a positive impact on vegetation. Removing a portion of the tree cover and brush component will allow the understory to maintain, improve and restore RLH.	/s/ R. Brinkerhoff	8/2/18
PI	Visual Resources (Angus)	Majority of proposed Project would be in VRM Class II areas though also in some Class III areas. Contrast ratings are needed to determine impacts and conformance with LUP.	/s/AAngus	7/16/2018
NP	Wild Horses and Burros (Stewart)	There are no Wild Horse and Burro Herd Management Areas within GSENM.	/s/ S. Stewart	7/23/18
PI	Lands with Wilderness Characteristics (Beal)	LWC will be analyzed in the EA	/s/ J. Beal	7/31/2018

FINAL REVIEW

Reviewer Title	Signature	Date	Comments
Kenneth (Brandon) Johnson (Environmental Coordinator)	/s/ Brandon Johnson	2/27/19	
Harry Barber (Acting Grand Staircase-Escalante Manager)	/s/ Harry Barber	2/27/19	
Whitney Bunting (Acting Kanab Field Office Manager)	/s/ Whitney Bunting	2/27/19	

APPENDIX D

MONITORING

VEGETATION MONITORING GUIDELINE

Vegetation Monitoring Schedule
Monitoring methods will largely follow the standard methodology established by the Utah Division of Wildlife Resources (UDWR) for measuring range trend. Baseline plots will be established prior to treatment ahead of each annual Project phase. All plots will be read annually for five years after treatment to determine treatment success and in five-year increments thereafter to determine trend. Plots will be read during the summer months and will be read at roughly the same time each year. Plot information will be recorded by range staff and botanists.

Sampling Methods
All sampling transects will be permanently marked on each end by 2-foot PVC-covered rebar stakes. Once the starting point of the transect is located using a GPS unit, a random compass direction will be used to determine transect direction. The transect direction will be recorded on the data sheets. The PVC sleeves will be labeled with the plot number and transect direction. Photos will be taken from each end of the transects facing the interior of the transect. White board photos with study name, plot number, date, and direction will be taken prior to each photo. Sampling transects will be 50 meters in length.

Vegetation cover will be measured using 0.5 x 0.5-meter frames placed on the left side of the transect every 2.5 meters, starting with the left side of the frame at the "0" mark. The base of the cover frame will be placed parallel to the transect line. Aerial plant cover for each species observed will be recorded using UDWR cover classes as listed on the data sheets. Cover is determined using an ocular cover estimation procedure using 7 cover classes (Bailey and Poulton, 1968, Daubenmire 1969). The seven cover classes are: 1) .01-1%, 2) 1.1-5%, 3) 5.1-25%, 4) 25.1-50%, 5) 50.1-75%, 6) 75.1-95%, and 7) 95.1-100%. For example, to estimate vegetation cover with this method, an observer would visualize which cover class all the vegetation would fit into if the plants were moved together until they were touching. To quantify percent cover for bare ground, litter, rock, biological soil crusts, the observer would visually estimate which cover class could accommodate all of the specified cover type within the quadrat. These numbers are then recorded. To determine percent cover for each transect, the midpoint for each cover class value observed is summed and divided by the number of sampling quadrats (20). Total canopy cover of shrubs or trees and medium and large litter is estimated using the line intercept method. The distance along each transect covered by a particular species of tree or shrub is divided by the total length of the line to give percent canopy cover.

The cover frame will also be used to determine frequency. Nested frequency values for the quadrat range from 1-5 according to which area or sub-quadrat the plant species or cover type is rooted in. The notation for each sub-quadrat is as follows: 5 = 1% of the area, 4 = 5% of the area, 3 = 25% of the area, 2 = 50% of the area, and 1 = the remainder of the quadrat. Each time a particular plant species or cover type occurs within the quadrat, it is scored relative to which of the smallest nested quadrats it is rooted in (in the case of vegetation) or where it first occurs (for all other cover types). The highest possible score is 5 for each quadrat occurrence and 100 per transect. Higher nested frequency scores represent a higher abundance for that plant species or cover type. These summed values are used to help determine changes in trend and composition through time. Nested frequency has been found to be a more sensitive measurement for changes taking place within plant communities than quadrat frequency (Smith et al. 1987, Smith et al. 1986, Mosley et al. 1986).

Data Analysis and Reporting

Trends in herbaceous plants as a group or as a single species can be determined by comparing the sum of nested frequency values between readings. Attention is also given to changes in species composition of grasses and forbs through time. A non-parametric statistical test (Friedman test which is analogous to analysis of variance) (Conover 1980) is conducted on nested frequencies of each species to determine significant changes at alpha = .10. Ground cover parameters are analyzed and compared in the discussions of the reread studies. Trends for soil are determined by comparing basic ground cover measurements and cover composition (herbs vs shrubs) between years as well as comparing photos and observer observations between readings. A ratio of the nested frequency values of protective cover types (vegetation, litter, and biological soil crusts) to bare soil can also be used to help determine changes in soil trend.

Data will be analyzed annually to determine if the site is meeting success criteria and to determine trends in vegetation. When success criteria are met a brief report will be compiled documenting how criteria were met. The report will contain data sheets, photos, and results of the data analysis to show that the criteria are met.

Contingency Plan

If success criteria are not met within five years of adequate growth conditions additional measures will be taken to facilitate site recovery. Site specific contingency plans will need to be developed based on the cause of restoration failure. For instance, if soil instability or erosion is assumed to have caused the failure, then erosion control structures will be installed prior to reseeding and the seed mix may focus on species with growth habits that can curtail erosion more rapidly than others. The contingency plan will be based on input from range, vegetation, and soil science specialists and will be approved by the Interdisciplinary team. Once the contingency plan is approved, treatments will be applied as part of the next annual phase.

RAINFALL SIMULATION/INFILTRATION STUDY

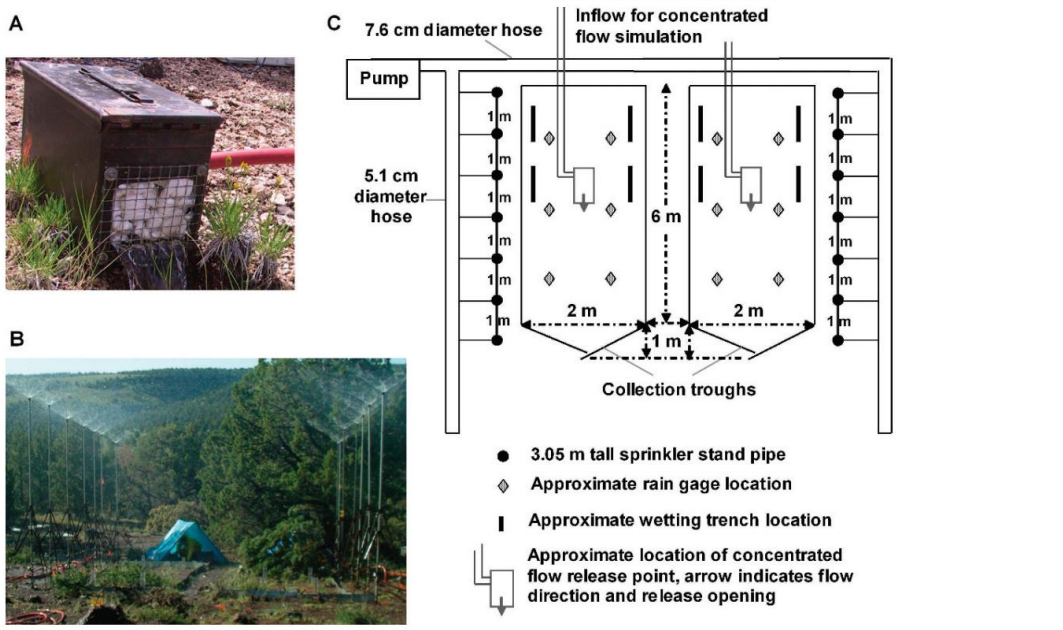
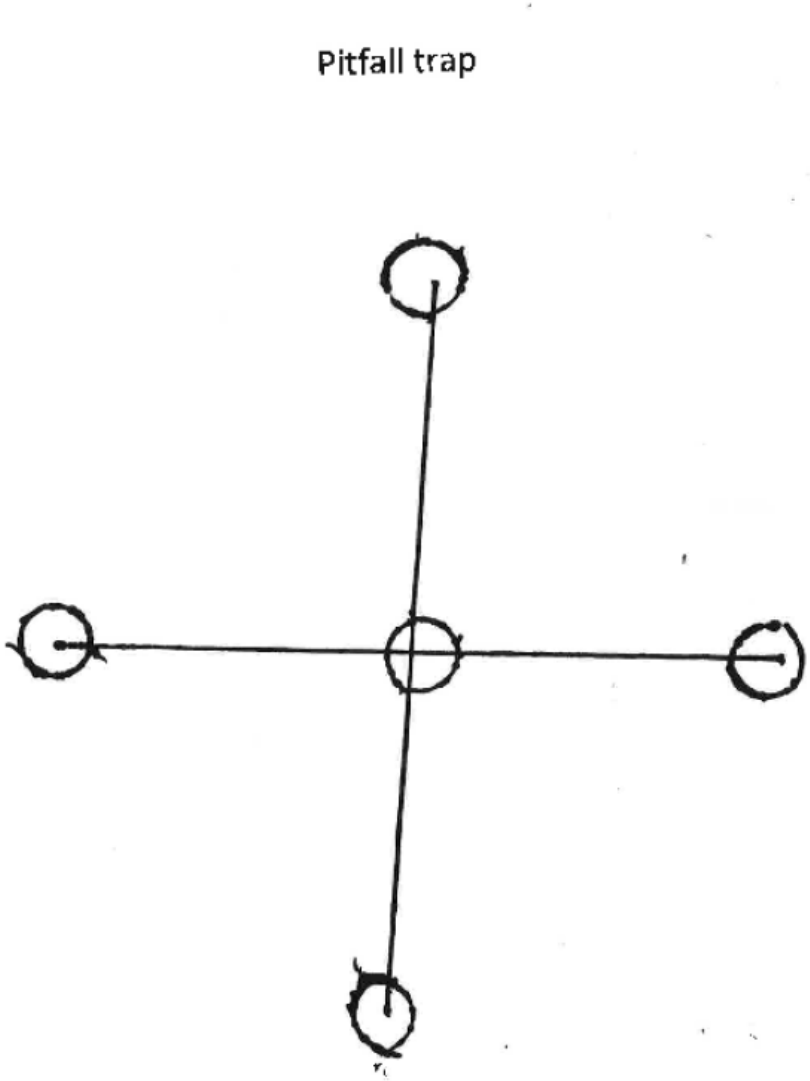


Figure 1. Illustration of paired large rainfall plot layout and design showing **A,** concentrated flow release point; **B,** large rainfall plot instrumentation; and **C,** drawing of paired large rainfall plot layout.

REPTILE MONITORING LAYOUT



APPENDIX E

WOODLAND TREE GROWTH FORM AND MORPHOLOGICAL CHARACTERISTICS

Post-settlement (<150 years) and Pre-settlement (>150 years) Woodland Trees (from Tausch et. al 2009)

Characteristic	Relatively Young Trees (<150 years)	Relatively Old Trees (>150 years)
Juniper Crown Shape	Conical with pointed tip	Flattened, rounded or uneven top
Pinyon Crown Shape	Conical with pointed to slightly rounded tip	Flatten, rounded or uneven top
Juniper Branch Structure	Branches become progressively smaller from bottom to top of tree	In open stands, large branches near the base
Pinyon Branch Structure	Branches become smaller from bottom to top of tree, general orientation is vertical	In open stands branches large near base and remain relatively large well into the crown, more randomly oriented
Dead Wood	Little dead wood in bole, few dead branches, little or no foliose lichen on juniper	Dead branches, bark missing, juniper covered by a light green lichen
Juniper Bark	Flaky, relatively thin with limited or shallow vertical rows	Thick, fibrous with well-developed vertical furrows
Pinyon Bark	Relatively thin, flay, with weak vertical furrows	Thicker, more plate-like structure than furrowed
Juniper Leader Growth	Terminal leader growth in the upper 1/4 of the tree, usually >2 in. In open stands, leader growth >2 in. from bottom to top	Leader growth in the upper 1/4 of the tree usually <1 in.
Pinyon Leader Growth	Leader growth in pinyon similar to juniper but not directly visible. Must look for bud scale scars to determine length	Leader growth in upper 1/4 of tree usually <2 in.

APPENDIX F

BLM RESPONSE TO COMMENTS

Issue	Comment #	Comment Summary	BLM Response
Air Quality	2-13	The EA fails to analyze in detail the foreseeable impacts on air quality, both regionally and locally.	Air quality was identified in the ID team checklist (Appendix C) as a resource that could be affected by the Project activities and therefore was fully analyzed within the EA. The EA recognizes that there would be short term impacts to air quality due to dust, mechanical equipment and prescribed fire. The EA was updated to discuss the effects from the No Action Alternative.
Alternative Develop-ment	9a-14, 9b	BLM should consider the Native Ecosystem Alternative and provide the public with an opportunity to comment. The Southern Utah Wilderness Alliance (SUWA) provided the Native Ecosystem Alternative in Comment #9b. The 10 points associated with this alternative are summarized below:	This proposed alternative was studied and considered as described within the final EA. For the most part, the aspects of the alternative that actually meet the purpose and need for the Project are not substantially different from the BLMs Proposed Action. However, there are some aspects of this alternative that seek to change the purpose and need from a sagebrush steppe enhancement Project to a pinyon-juniper management Project, seeking to protect the very causal factor of ecosystem degradation occurring within the Project area. Much of this alternative reads as a research proposal instead of a viable alternative to meet the purpose and need for the Project as stated within the EA. For these reasons, this alternative was considered but eliminated from detailed analysis.
		Point 1: Prior to Project implementation, complete a mapping exercise of the area depicting the three types of pinyon-juniper vegetation (persistent pinyon-juniper woodland, pinyon-juniper savannah, and persistent shrubland). Treat areas with a forest-type prescription, rather than for tree removal. Prioritize leaving pinyon over juniper, especially larger and older trees.	Point 1 BLM Response and Rationale: This alternative fails recognize the science based conclusion that the Project area is predominantly a sagebrush ecological site. Because of this, it fails to meet the purpose and need of the Project which is to reduce or remove pinyon-juniper trees in an effort to promote sagebrush steppe habitat and to return the area to a fire regime and condition class that resembles the natural historical site. As depicted in table 2, 85% of the area proposed for treatment is within a sagebrush ecological site. The remaining 15% is within areas that produce sagebrush steppe as the primary understory. The purpose of the Project cannot be met by leaving the area dominated by trees. The purpose of the Project is not to manage pinyon-juniper stands that have encroached on sagebrush sites as a forest or woodland.
		Point 2: Map the expected dominant vegetation throughout the Project area utilizing Ecological Site Descriptions (ESDs). Remove pinyon-juniper only in areas where ESD evidence show that sagebrush/grassland communities are expected. Where pinyon-juniper is the expected dominant vegetation type, manage with a stand index prescription leaving a full range of age and size classes. Remove no trees in excess of 150 years.	Point 2 BLM Response and Rationale: This alternative is substantially similar in design to the Proposed Action alternative. The EA clearly demonstrates what the expected vegetation types within the Project area are and explains that this is tied to ESDs (Section 2.1.1). Tree removal areas match sagebrush ecological sites on 85% of the Project area (table 2). Trees removed within pinyon-juniper sites are targeted in areas to reduce heavy fuels or promote the sagebrush steppe understory, which is a component of pinyon-juniper sites (Section 2.2). Design features were incorporated to protect old growth trees (Section 2.3.3).
		Point 3: Substantiate pinyon-juniper expansion and infilling prior to treatment by coring and aging trees on the Project area. Remove no trees in excess of 150 years old. In thinning areas,	Point 3 BLM Response and Rationale: This reads as a research proposal and not as a realistic alternative to meet the purpose and need for the Project. Pinyon-juniper expansion, as noted in the EA, is not controversial or disputable. It is occurring. Coring trees on a 30,000 acre Project area is not reasonable or feasible. The EA lays out evidence for tree expansion in the form of historic photographs, ecological site descriptions, altered fire regimes and condition class, and existing vegetation. To meet the purpose and need

		remove small trees only, leaving a full range of age and size classes. Determine whether maintenance treatments are needed in the future, the frequency of such treatments, and the ability of the agency to conduct such treatments. Establish quantitative desired outcomes prior to treatment. Do not remove sagebrush in GRSG winter habitat. Conduct treatments in phases by treating the eastern half of the GRSG PHMA first and then the western half if objectives have been met.	for the Project, trees need to be removed from sagebrush ecological sites and other sites with the potential to grow sagebrush. Leaving trees seeks not to meet the stated purpose and need but to change it entirely. The EA describes past treatments and the need for continued maintenance as part of natural plant succession. Quantitative treatment objectives are outlined in section 2.2. Simply not removing sagebrush within GRSG winter habitat does not meet the purpose and need to establish healthy and resilient landscapes. Guidelines for sagebrush habitats for GRSG are established in the 2015 ARMPA. The EA already states that the treatments would be done in a phased approach. Treating the eastern half of GRSG habitat first does not make logical sense due to the fact that the existing GRSG reside on the west side of the Project area. ARMPA plan direction calls for treatments adjacent to occupied habitat.
		Point 4: Prior to conducting treatment, conduct cultural surveys to identify sensitive cultural resources. Do not treat cultural sites or treat only with hand tools. Buffer the cultural sites. Share the data obtained from cultural inventories with interested stakeholders, and tribes.	Point 4 BLM Response and Rationale: This is substantially similar to what has been proposed. This is standard practice. Refer to section 2.3.10.
		Point 5: Describe post-treatment outcomes and mitigation for older pinyon-juniper stands. Describe potential adverse impacts to nongame species habitat. Map the area pre-treatment for declining bird species. Do not remove pinyon and juniper in pinyon jay habitat.	Point 5 BLM Response and Rationale: This is substantially similar to what has been proposed. The desired future condition statements within section 2.1.4 describe the desired outcomes to a myriad of species both plant and animal. Section 3.3.4 describes nongame species use within the Project area and lists bird species expected to be found in the area. Expected impacts to these species is discussed in section 3.4.4. The Project seeks to return the current vegetation type (pinyon-juniper) to its natural state (sagebrush) based on ESDs. The purpose is not to manage the area for bird species that would not be present were it not for the altered state of the habitat. Under normal conditions, pinyon Jay would not be expected to be found within most of the area proposed for treatment as 85% is a sagebrush ESD. Managing this habitat strictly for a bird that is a pinyon-juniper obligate species makes no logical sense. If managed for potential habitat, pinyon Jay would naturally be a very small component of the biological diversity of the area.
		Point 6: Minimize ground disturbing heavy equipment. Map the area for erodible soils and biological soil crusts. Use the hand-thin method only in areas with erodible soils and BSC. Avoid treating anthills. Do not utilize heavy equipment within 30 meters of channel edges. Do not utilize heavy equipment to deposit treatment slash in channels. Do not use the harrow or anchor chain for vegetation removal.	Point 6 BLM Response and Rationale: This is not substantially different from what is being proposed currently in the EA. Hand-thinning of trees is a viable method and one the BLM intends to implement in site-specific areas. Utilizing this method is already within the decision space of the line officer and does not need to be analyzed as the sole method as the impacts of this treatment are analyzed. Channel edges are not immune from the landscape scale problems associated with pinyon-juniper encroachment and therefore simply not treating them does not meet the purpose and need. These areas in particular could benefit from stabilized soils and reduced erosion. To suggest that treatment debris be carried by hand and placed within channels is not reasonable or feasible since the Project area consists of 130 miles of channels. The anchor chain and harrow are approved methods within the current management plan and are effective means of reducing sagebrush and other shrub density. As stated in the EA, this method is not to be used to reduce tree cover. No viable alternative to this method was presented within this alternative.
		Point 7: Treatments utilizing fire should mirror the historical stand structure and	Point 7 BLM Response and Rationale: The use of fire to achieve the purpose and need of the Project is presented and analyzed within the EA. Fire would be used primarily as a maintenance tool to preserve Project integrity only

		fire regime. Natural ignitions of fire are managed for resource benefit.	after mechanical treatments. As stated in the EA, the area is so departed from normal conditions that fire cannot be allowed to play its natural role until mechanical treatments are used to reduce fuel loads. Decisions related to the utilization of naturally ignited fires to achieve management objectives are not within the scope of this EA but exist rather within district fire plans and are subject to outside factors such as fire planning levels, current fire conditions, and weather forecasts.
		Point 8: Prior to treatment, survey areas for invasive species would take place. Areas with greater than 10% invasive species cover would not be treated. Non-chemical methods of weed control would be used prior to using chemicals. Native seed is used in restoration and is seeded aerially or by hand.	Point 8 BLM Response and Rationale: This is not substantially different from what is being proposed currently in the EA. As stated in the Monitoring section, areas to be treated would be surveyed prior to treatment. This would establish baseline vegetation data, including percent cover of invasive species. Simply not treating areas with weed cover does not meet the purpose and need of reducing tree cover and restoring the area to a healthy, resilient landscape. If these areas are not treated and were to burn, cheatgrass is much more likely to dominate the site than if controlled mechanical methods are used in combination with seeding. As stated in the EA, native seed only will be used in new treatment areas and the seed would be applied aerially as the preferred method.
		Point 9: Determine quantitative desired outcomes and a detailed monitoring plan prior to Project implementation along with triggers for adaptive management. Establish monitoring plots and conduct baseline surveys prior to treatment. Phase Project implementation so that results from one phase inform treatment methods of the other.	Point 9 BLM Response and Rationale: This reads like a research proposal and not like a meaningful alternative to accomplish the stated purpose and need. Furthermore, the components of this alternative are not substantially different from what is already contained within the EA for analysis. The Measurable Treatment Objectives and Monitoring sections in chapter 2 outline quantitative objectives and how they will be monitored. They also contain adaptive management and contingency plans. Furthermore, the EA already states that the Project would be implemented in phases over a 15 year period.
		Point 10: Do not graze within GRSG PHMA during winter months or during the growing season. Rest some areas from grazing for a minimum of four years, even if objectives have been met prior. Utilization from livestock should not exceed 30% on normal years or 20% on drought years. Establish a network of grazing exclosures along with a paired plot. These exclosures would be monitored annually for five years to determine of objectives are met. Construct 10 exclosures in the first phase within sage-grouse PHMA along with a paired plot.	Point 10 BLM Response and Rationale: Much of this alternative reads like a research proposal and not a meaningful alternative to accomplish the stated purpose and need. These recommendations are not within the scope of the EA. Grazing management is controlled by Utah standards and guidelines for rangeland health and by allotment specific grazing plans. Rest periods after treatment are established in these guidelines. Decisions related to grazing management would be made after treatment and are dependent upon the outcomes of monitoring. While exclosures can be useful at times to differentiate between Project success or failure and the associated causes, they can also be achieved by other means that are much less intrusive, cost effective, and ones that do not increase risk to wildlife movement or mortality. Constructing dozens of exclosures and monitoring so many sites is not reasonable or feasible.

Alternative Develop-ment Grazing	4-13	A reasonable alternative to meeting the Purpose and Need might be to reduce or eliminate grazing in combination with allowing natural fires to burn.	Simply removing livestock from the area will not meet the stated purpose and need for the Project. Conifers and sage grouse are not compatible whether cows are grazing in the area or not. Removing cattle alone will simply not make thousands of acres of highly altered habitat become healthy again. As outlined in the EA, the tree density of the Project area is the root cause of the ecosystem degradation and the trees need to be removed to meet the stated objectives. This was not analyzed as an alternative but was looked at in depth as a post-treatment temporary option. Grazing management other than temporary rest until objectives are met is not being decided by any decisions made under this analysis. Furthermore, areas that are in Fire Regime Condition Class 3 (93% of the Project area) are no longer good candidates to simply "let fire burn". As stated in the management options for these areas, significant mechanical treatment is needed *before* fire can be allowed to play is natural role.
Relict Plant Commu-nities	9a-7	The EA identifies protection of relict plant communities as a goal but then fails to describe any actions the BLM will take to achieve that goal.	The appropriate word to use would have been "unique" as was correctly worded in chapter 2 in the vegetation section to describe these same three species. The use of the word relict in chapter 1 has been changed to "unique" in the final EA. The use of mechanical tools to remove targeted vegetation grants us the flexibility to remove exactly what we want and leave untargeted vegetation untouched, unlike a catastrophic fire that takes everything in its path. Chapter 2 in the vegetation section clearly states that these unique vegetation types would not be targeted for removal.
Ancient Trees	9a-8	The proposed removal of all pinyon juniper is in violation of the Monument plan and proclamation if relict areas of pinyon and juniper trees are not identified and avoided prior to treatment.	We are assuming that the use of the word "relict" in this comment is referring to "old growth" or "ancient" trees based on the context of the comment. The inclusion of old growth trees as an object to be protected within the proclamation clearly refers to trees that are located on pinyon-juniper ecological sites and are very old (in some cases 1,400 years old or older). The intent of the management plan is not to prohibit the cutting of trees that are several hundred years old. This is evidenced by the inclusion of two firewood cutting areas on the monument that are located almost entirely within pinyon-juniper ecological sites and have very large trees with growth characteristics typical of several hundred year old trees. Yet the management plan places no restrictions on cutting such trees for firewood. The Project as proposed essentially allows the same types of actions. Old growth trees are not a target of the proposed vegetation treatments. As stated, trees are most likely to be removed in sagebrush-grassland ecological sites which would consist of trees that are much younger than those mentioned in the plan. The likelihood of encountering a tree in excess of a few hundred years old within the Project area is nearly non-existent. For a tree to achieve an age of a few hundred to up to 1,400 years, that would mean that fire hasn't played a role in the ecosystem for that same time period. Only .6% of the Project area is in FRCC 5 which is defined as a fire return interval of 200+ years. This means that within the Project area, 99.4% of the area is not likely to contain old growth trees. Trees that become old only due to lack of ecological disturbance are not a target of intense protection within the management plan.
Ancient Trees	2-10, 4-10, 9a-9	The EA fails to analyze in detail the foreseeable impacts of the Project on old growth pinyon and juniper stands. Coring samples should be gathered throughout the Project area in a statistical design. BLM should map relict areas and avoid them during treatment.	Aside from scientific curiosity, this is not necessary. The intent of the Project is to restore sagebrush steppe habitat which is being encroached upon by pinyon-juniper trees that have been allowed to persist only due to lack of ecological disturbance. While some trees may be several hundred years old, the likelihood of finding a tree in excess of 1,400 years old within the Project area is almost 0% since 98% of the Project area historically had a fire return interval that would not allow the growth of such old trees. According to circular 1335 from the USGS, old growth trees are likely to be found on rock outcrops and steep slopes. These areas would not be treated under the Proposed Action, therefore, the threat to this resource due to the Project is negligible.

Biological Soil Crust (BSC)	9a-24	Areas where biological soil crust is abundant should be located, mapped and avoided.	While the functions that BSCs perform (e.g., soil stability, increases in nutrients, etc.) are a component of a healthy landscape, they alone do not provide the energy requirement necessary to drive a transition between ecological states, thus the need for management actions outlined in the EA. Biological soil crust are a component of a healthy landscape, however, alone their presence does not automatically suggest a healthy, resilient landscape. In fact, areas dominated strictly by pinyon-juniper and biological crust are some of the least resilient sites within the Project area, even when BSC are present and functioning. If a fire were to occur, these sites are more likely to become a monoculture of invasive annual weeds than other sites that have an existing perennial grass and forb understory. Simply avoiding areas with biological soil crust does not help to meet the purpose and need for the Project. The use of mechanical equipment that does not drag across the surface of the ground such as a masticator would largely leave the existing biological soil crust intact to help stabilize the treated area until seeded vegetation establishes. Previously treated areas (treatment type 3 in the EA) may have equipment drag across the surface to reduce sagebrush cover. However, the likelihood of finding well developed biological soil crust in these areas is low since they have already been treated by similar methods in recent decades and largely consist of intact herbaceous vegetation which serves as the soil stabilizer, limiting the sites need for biological soil crust.
Biological Soil Crust (BSC)	9a-11, 9a-31	During BLM's November 2, 2018 field trip to the Project area, it was clear that targeted pinyon-juniper communities included developed biological soil crusts. Disrupting these communities runs the risk of exposing soils to erosion and exotic invasion.	The area you mention from the field tour is actually not within the boundaries of this proposed EA. Therefore, our response is geared toward your comment regarding erosion and invasive weeds in general but not specific to any one area. Tree removal in phase III pinyon-juniper that has encroached on sagebrush ecological sites is not conducive to hand-thinning and will likely be masticated. Mastication involves no type of equipment or implement that would drag across the ground and rip up biological soil crusts. This method leaves the existing biological soil crust mostly intact where it will serve to continue stabilizing the ground until the seeded vegetation fills in. This will help reduce erosion and limit exotic invasion. There are also consequences of doing nothing. If an intense fire were to remove the trees from this phase III site, the erosion and subsequent domination by invasive annual species is far more harmful than the actions proposed which entail mimicking fire effects in a controlled manner on our terms.
Biological Soil Crust (BSC)	9a-25	Biocrusts should be harvested prior to treatment and re-established afterward as outlined in studies done by Dr. Matthew Bowker.	These studies have only demonstrated re-establishment of BSC on small plots or under controlled laboratory conditions, and although restoration of BSC remains a possibility, research so far have not shown whether BSC restoration is possible at the landscape scale. The methods proposed will largely leave the existing crust intact, although possibly covered with litter and debris. Biological soil crusts will remain within the treated areas and can expand as litter and debris break down over time.
Carbon Seques-tration	9a-26, 10-11	BLM must take a hard look at the effects of the Project on carbon sequestration. The EA does not address the loss of carbon sequestration capacity caused by tree removal.	The ID team checklist (Appendix C) was updated to include effects to carbon sequestration. As noted in the checklist, net changes to carbon storage capabilities are not quantifiable based on various factors. Short term loss of carbon storage is likely to occur but treatments can reduce carbon-loss from wildland fire emissions over the long term. Soils store over 2/3 of carbon on Federal lands in Utah and reduction in biomass carbon storage from the Proposed Action will be small compared to the total land sequestration capability in the state. Further analysis within the EA is not warranted.
Climate Change-Pinyon Effects	9a-5, 9a-19,	The EA needs to consider recent studies that suggest that pinyon trees are struggling as the climate warms and dries.	This argument is not relative to the EA. The Proposed Action is to remove pinyon and juniper that are encroaching on sagebrush steppe habitat. In a natural condition, pinyon would be very limited within the Project area. This Project area is not being managed as a refugia for pinyon pine trees regardless of what effects climate change is having on these trees.

Climate Change	2-1, 9a-26	The EA fails to describe and analyze in the required detail the reasonably foreseeable impacts of climate change in the Project area, including increasing annual average temperatures, and changes in the type and timing of precipitation events.	While greenhouse gas emission (GHG) factors have been developed, they are based primarily on laboratory measurements with regional fire assumptions. Additional field measurements are needed before emission factors are refined enough to quantify GHG emissions at a Project level. Emissions from a specific Project vary based on treatment type, vegetation type, acreage, mass of vegetation, combustion completeness, and meteorology. As a consequence, impact assessment of specific effects of anthropogenic activities cannot be determined. Over the short term there is likely to be emission of GHG and loss of carbon storage capability but have a long term benefit with reduced carbon-loss from wildland fire emissions and improved carbon sequestration with more resilient vegetation and soil ecosystems. Additionally, specific levels of significance have not yet been established. Existing climate prediction models are global in nature; so are not at the appropriate scale to estimate potential impacts of climate change on the Project area. Some areas of the globe are predicted to increase in temperature while others are predicted to decrease. Minor temperature changes will have their greatest impact at the fringe of species range. A healthy, resilient landscape is more capable of softening the effects of climate change than a depleted, degraded landscape. Design features such as using native seed only on at least 75% of the Project area will also help these sites be more resilient to climate change. Seed mixes applied during treatment will be diverse, containing a mixture of cool and warm season species to take advantage of any moisture received whether it be winter or monsoonal.
Climate Change	8a-2	The normal ecological conditions cited in the EA are historical. Given the reality of climate change, conditions may not be realizable in the future.	The EA as written lays out a strong case for the current conditions on the landscape being tied more to past grazing practices and fire suppression than climate change. There is still much uncertainty regarding impacts of climate change and the tools necessary to predict future outcomes at this scale are not available. Our current direction is to manage for healthy, resilient landscapes and this is what the Project seeks to do.
Cultural/ SHPO	7b-2	BLM has ignored NLCS requirements involving cultural resources. According to NLCS, BLM must identify priority areas within NLCS units for nomination to the National Register of Historic Places, for cultural resource inventories, and for archaeological research consistent with the BLM 8100 manual series (Cultural Resources Management). Inventory priorities must be determined at least in part by resource values and the risk of disturbance, including loss of the resource to theft or erosion.	As stated in the EA (Chapters 2 and 3 under Cultural Resources), a cultural resource inventory will be conducted, and identified cultural resources evaluated for eligibility to the NRHP. This is in accordance with BLM policy, Section 106 of the NRHP. "The BLM will continue to inventory and conduct Project compliance for archaeological resources". Identified sites would not be treated unless treatment would actually be found to benefit the site. Treatments within these areas would be conducted in the least intrusive manner to protect the identified resources. Because the scope of this Project extends through several years and individual treatments are subject to modification it would not be practical or cost effective to conduct an inventory in advance of Project planning. Changes in the landscape from natural processes can affect the visibility of surficial archaeological resources and pedestrian inventories are most effective if conducted within a reasonable time frame of Project implementation. In addition, Section 106 regulations support this approach - 36 CFR 800.4(2) allows for the phased identification and evaluation of cultural resources where "alternatives under consideration consist of corridors or large land areas, or where access to properties is restricted, the agency official may use a phased process to conduct identification and evaluation efforts".
Cultural/ SHPO	2-5, 2-6	The EA fails to provide a reliable inventory of paleontological or archaeological resources that stand to be impacted in the Project areas.	In the interdisciplinary team checklist (Appendix C), dated 7/31/2018, Dr. Allan Titus, a paleontologist for the BLM, noted that there would be no impact to paleontology from the Proposed Action because the treatment areas are not likely to produce fossil resources. Therefore, this resource did not merit further analysis within the EA. As stated above, archaeological resources are likely to be found but each treated area would be surveyed prior to implementation and appropriate action taken to reduce or completely avoid impacts to this resource. Archaeology is fully analyzed within the EA and potential impacts are disclosed and discussed.

Drought	9a-38	Drought should be considered in the EA. Drought triggers should be included detailing how BLM will respond and adapt to drought conditions.	Drought is something difficult to predict even with the best models. If prolonged drought occurs after Project implementation, the success of the Project may be impacted and that would be reflected in post-treatment monitoring. The EA in chapter 2 gives very specific treatment success criteria. If those criteria are not met due to factors such as drought, a site specific contingency plan would be drafted. Contingencies may include re-treatment using different treatment methods, different seed mixes, or timing of implementation. This is discussed in the monitoring section of chapter 2 within the EA.
Ecological Site	4-12	A field-based inventory of the Project area was apparently not conducted. Instead, only NRCS ESD data was used. A FONSI cannot be reached until field data is collected and analyzed.	Soil surveys and ecological site descriptions are provided by Natural Resources Conservation Service (NRCS). The BLM's standard is to use NRCS data, recognizing this agency's special expertise and responsibility. BLM is not required to produce new information for Project evaluation. We are required to use the best available data. In many instances, the ESD data which comes from the NRCS is the best available data we have. While we may not be able to complete an inventory on the entire Project area, each treated area would have a study site established wherein the ecological sites would be confirmed. Additionally, the areas proposed for treatment were ground-tested with ocular inventories to confirm that these sites have the characteristics of sagebrush steppe ecological sites.
Ecological Site	9a-4	The Project must not attempt to alter vegetation communities to anything other than their potential as described in the ESDs in GSENM.	The intent of the Project as explained in the EA is to return this area to a healthy state matching its ecological potential based on ecological site data. A site's ecological potential exists in a range depending upon how long in the past the most recent large disturbance occurred. For example, an area that has had recent fire activity would be dominated by grasses and forbs and largely devoid of shrubs and trees. And an area that has not had fire for many decades would have little to no grass or forbs and be dominated by shrubs and eventually trees. Because of this range, BLM has broad latitude when conducting treatments. Treatments would be done in a mosaic pattern leaving some areas of late seral vegetation while others would be restored to early or mid-seral, but still within the range of the ecological site potential.
Ecological Site	9a-3	If the goal is to move the site toward reference conditions, shouldn't the ESDs for these sites determine the percentage of trees to remove?	In some areas, yes, in others no. As stated above, ecological site potential exists in a range driven by disturbance (e.g., fire). BLM has broad latitude to manage for either early, mid or late seral. While all seral stages are important, early and mid-seral are the most "healthy" and mid seral would have the greatest species diversity (plant and animal) by far. Also, some areas have been allocated for greater sage-grouse. In these sage-grouse areas, current guidance is to remove nearly all trees which either outcompete the shrub-steppe habitat required by the grouse or serve as perches for predators such as raptors. In these areas, the goal is to manage all lands ecologically capable of producing sagebrush as sagebrush grasslands. Grouse may not use areas with as little as 2-4% tree cover. Therefore, in some areas, all trees would be removed to manage for sage-grouse. Not all areas within a polygon would be treated for complete tree removal. In Project design, decisions will be made to leave appropriate stringers or islands of trees to protect sensitive areas or to provide hiding and thermal cover for wildlife. As much as 30% of any treatment area would likely be untreated when the final Project level polygons are developed.
Ecological Site	7b-4	The EA uses ESDs as determinants of HCPC but fails to explain how sagebrush can be the HCPC on sites dominated by old growth PJ. BLM needs to support its use of ESDs.	There are no "old growth" pinyon-juniper sites within the Project area slated for treatment that we are aware of. The possibility of such sites would be very low due to historic fire regimes. Such sites would be located in areas where fire would have not played a role due to geology (rock outcrops) or ecological site potential (would exist in a site naturally devoid of fine fuels such as grasses, forbs and shrubs needed to carry fire). Figure A-3 of appendix A depicts the ecological sites within the Project area. Only 2,087 acres of the Project area or <4% has rock outcrops where one would expect to find very old trees. These areas are not targeted for treatment, further reducing the potential for removal of old growth trees. Old growth trees have a very distinct growth form and appearance as outlined in USGS circular 1335 (Appendix E within EA). As Project boundaries are delineated, staff will look for these characteristic growth forms and avoid treating these areas if identified as long as the objectives for the Project can still be met and other resource allocations such as sage-grouse do not exist.

Ecological Site	2-2, 2-3	The EA fails to describe in detail how the proposed Project will return portions of the Project area to a historic condition. The EA also does not describe how a reference historic period was chosen, and the reasoning behind the selected period.	The ecological state does not include a time period or historic period. States are defined as stable, long-term ecological conditions that are produced on a site due to the interactions of the biological, physical, and disturbance factors. The reference state for an ecological site is generally thought to be the pre-European settlement or pre-anthropogenic disturbance condition because the human disturbance factor would have been minimal.
Exclosures	9a-37	Our scoping comments recommended that a network of large grazing exclosures throughout GSENM be part of the monitoring effort. BLM responded that exclosures were not an accepted method of monitoring. The methods we suggested for data collection are the same as what BLM uses (percent cover, frequency).	While some of the data gleaned from monitoring would be the same (percent cover, frequency), the methodology to obtain the data differs from BLMs methods. Constructing exclosures at the level suggested by SUWA is not reasonable or feasible and is not necessary. In particular, constructing dozens of exclosures within GRSG PHMA is not recommended as fences are known strike hazards to GRSG. Additionally, the amount of effort required to maintain these exclosures, let alone collect vegetation data annually for a five year period on this amount of exclosures is not reasonable or feasible given BLMs current workload, diverse priorities and limited staffing levels. As stated in the EA, vegetation response data will be collected in each treatment area prior to treatment and for five years thereafter. This data will be compared to data gathered in five year increments thereafter to determine the current vegetation trend. Causal factors of vegetation condition can be made by conducting rangeland health assessments and following the standards and guidelines for rangeland health without the need for dozens of costly, high input exclosures.
Fire	9a-21	The EA states that lack of fire has degraded habitat conditions of sage grouse. However, fire was not a large driver of ecosystems change in the Project area.	We disagree. Lack of fire has allowed pinyon and juniper to infill and expand to a point where they dominate the landscape. Tree cover is what has degraded the habitat for sage-grouse as well as the entire ecosystem. According to the fire regime data, 98% of the Project area had a fire return interval of 0-35 years. Fire was likely the foremost ecological disturbance agent at work within the Project area whether or not you agree with its return interval. Regardless of the return interval whether it be 0-35 or 0-125, fire has only affected 1% of the Project area in the last few decades and this is causing major impacts.
Fire	7b-1, 9a-6	The EA asserts that the area has a natural fire return interval of 0-35 years, which is incorrect. The old growth pinyon-juniper indicates that the fire return interval cannot be less than 100-200 years. Also, fire return intervals of less than 60-80 years cannot support non-mountain sagebrush species.	The fire data referenced by the commenter comes from studies conducted on pinyon-juniper woodlands, not sagebrush steppe ecological sites and is therefore irrelevant. Based on ecological site data for the Project area, most of the area exists in a sagebrush ecological site. Fire Regime Condition Class (FRCC) is outlined in the Forest Service Rocky Mountain Research Station technical report entitled "Development of Coarse Scale Spatial Data for Wildland Fire and Fuel Management" (RMRS-87, 2004). The Healthy Forest Restoration Act adopts this classification system, and as mandated by national direction, the SUSA FMP utilizes the FRCC classification system to rank existing ecosystem conditions and prioritize areas for treatment. To say that 98% of the Project area had a fire return interval of 0-35, does not mean that every acre of that 98% was fully consumed by fire. Areas within fire regime 1 burned at return intervals of 0-35 years but less than 75% of dominant overstory is replaced. Areas within fire regime 2 burned at return intervals of 0-35 years but had a higher severity where greater than 75% of the dominant overstory vegetation is replaced. Therefore, it's not only possible but likely that even within areas of 0-35 year fire regime, one would expect to find sagebrush in various seral stages all the way from early to late. One would still expect certain areas to have not burned for much longer than 0-35 years based solely on a mosaic burn pattern which would have been likely under historic condition.
Fire	9a-6	The EA states that the Proposed Action would address the problem of woody fuels and reinstate low intensity fire regimes. This is unnecessary and damaging to resources, according to the ESD description of the small role of fire in this area.	The ecological site concept for Mountain Big Sagebrush (R035XY308UT) states "Cheatgrass is the most common non-native species to invade the understory, two-needle pinyon and Utah Juniper are capable of dominating the site when fire is suppressed well beyond the natural fire return interval of 15-40 years." Fire is also referred to as a disturbance factor that leads to invasive plant communities in this ESD. The ESD for PJ indicates fire return intervals of a minimum of 100 years, much less frequent than Mountain Big Sage, but still a component of the disturbances related to ecological sites found in the Project area.

Fire	9a-20	The EA states the need to reduce fuels in the wildland urban interface, but there are only a few scattered properties in the Project area. With defensible space around these homes, the number of acres treated to address fire concerns could be reduced.	Wildland Urban Interface is only one very small component of this Project area. While it is true that there are not many homes or other structures within the Project area, these few homeowners stand to benefit from reduced flame lengths and less intense fire due to treatment activities. Reducing Project acreage because there are not many homes or structures does not account for the other objectives of the Project. If WUI were completely non-existent within the Project area, the Project would still be necessary to address these other resource issues.
Fire	4-9	The Project proposes to reduce the likelihood of high severity fire, lessening the chances of damage to human life or property. Numerous studies show that whether a structure burns in a wildlife is determined by the composition of the structure itself and conditions within 100 feet of the structure. Fuel reduction in the wildland do nothing to reduce the wildfire risks to humans or their property.	We do not disagree that composition of a structure may determine whether a structure ultimately burns or not. However, we also know that flame lengths produced by sagebrush-grassland are much shorter and fires less intense than in a burning pinyon-juniper woodland. The decreased intensity and flame-lengths often are the difference in whether fire crews can initiate suppression activities or not. There is little doubt that removing large fuel loads aids in fire suppression.
Herbicide	4-5	The EA states that herbicides may affect aquatics. You are only using a programmatic EIS that covers 17 states in your analysis. Provide a Project area-specific analysis of the effects of herbicide use.	The ID team checklist (Appendix C) addresses the potential for water quality impacts from herbicide use. These potential impacts are fully analyzed in the programmatic EIS that covers the 17 western states. Impacts from this Project are not expected to differ from those analyzed in that EIS.
Historic Seedings-Condition	9a-28, 9a-34	The EA provides no information as to which potential treatment areas are old seedings and previous treatments. Recently treated areas should be removed from the Project and managed so they don't need to be retreated.	To the contrary, the EA clearly states in chapter two that over 7,000 acres of the proposed Project area is historic vegetation treatments and describes them in detail in the "current condition" section. This is treatment type 3 in the EA. Also, a map is provided in Appendix A (Figure A5) so one can easily distinguish which areas fit this description. To suggest that previously treated areas be removed from further treatment suggests a lack of understanding of natural ecological succession. Vegetation is not static under normal conditions. Therefore, it is expected that even after a treatment, eventually those areas may need maintenance to retain desired vegetative conditions. If the maintenance does not come naturally (fire), we propose to mimic fire with mechanical treatments. The idea that vegetation in an area always remains the same under ideal conditions is not supported by science.
Historic Seedings-Retreat	2-8	The EA fails to describe and analyze in detail the history of past vegetation management Projects in the area, including an analysis of the results generated.	Historic vegetation management Projects are discussed in chapter 2 of the EA under treatment type 3. As stated in the EA, these areas are often the only areas that still have a remaining understory of herbaceous vegetation and are the only areas where sage-grouse are consistently observed.
Invasive Weeds	7b-7	The EA does not provide invasive surveys. Cheatgrass is the primary threat from this proposed ground disturbance.	Invasive species information is generally gathered through remote sensing methods. However, BLM has numerous vegetation trend study plots within the Project area that would show the presence or absence of invasive species and their most recent trends. Potential impacts from invasive species due to the Project are discussed within the EA.
Invasive Weeds	1-4, 9a-12, 9a-22, 10-7	The Project could potentially damage the soil profile and open the plant environment to invasive species.	As with any ground disturbing Project, there is potential for an increase in invasive species, especially in the short term. These potential impacts are disclosed and discussed within the EA. However, BLM still expects to see a net improvement in habitat condition and site resiliency which will better limit densities of invasive species in the future. Catastrophic fire in a landscape that is not resilient to it such as the Project area is more likely to become dominated by invasives than areas treated mechanically.

Lands with Wilder-ness Character-Impacts	4-4, 10-10	Three square miles of LWC will be taken out of the LWC category by mechanical removal of juniper-pinyon woodland. Using mechanical equipment in these areas damages the wilderness character.	As discussed in the EA, these impacts are temporary and of short duration and may or may not affect the overall wilderness character. BLM has committed to treating these areas in a manner that will not permanently alter the wilderness character. Moreover, although some wilderness character lands exist within the Project area, no decisions regarding the management of these lands have been made within the current management plan, whereas much of the area with wilderness character has been allocated for greater sage-grouse.
Livestock Grazing	9a-23	The EA attributes the current soil conditions and BSC in the area to historic livestock grazing and wildfire suppression. Since fire was not a determinant of ecosystem processes according to the ESDs, then grazing is the main reason BSC is below potential.	While fire plays less of a role in the P-J Ecological Sites (e.g., 100 + year return intervals) other ecological sites do rely on fire for natural disturbance. The ecological site concept for Mountain Big Sagebrush (R035XY308UT) states "Cheatgrass is the most common non-native species to invade the understory, two-needle pinyon and Utah Juniper are capable of dominating the site when fire is suppressed well beyond the natural fire return interval of 15-40 years." Fire is also referred to as a disturbance factor that leads to invasive plant communities in the Mountain Big Sagebrush ESD. The EA lines out how the lack of an ecological disturbance mechanism such as fire can have dire consequences to the whole ecosystem of which soil is one component. The EA states that grazing has contributed but it is not the sole contributor as this comment suggests. Regardless of the reasons of why the landscape is in its current condition, the greater question remains of what can be done about it. The Proposed Action seeks to do something to restore a healthy, resilient landscape.
Livestock Grazing	9a-2	The scoping letter states the Project purpose is to provide livestock and wildlife forage. These purposes violate the Federal Land Management Policy Act (FLPMA) because they are averse to the 2000 GSENM Monument Management Plan (MMP).	This is a false statement. Nowhere in the scoping letter is the word "forage" even found. A truthful statement of the purpose of the Project would be a direct quote from the scoping letter which reads: "The purpose of the proposed Project is to maintain suitable and functional GRSG habitat at a landscape level to ensure the long-term viability and persistence of GRSG, by removing encroaching pinyon and Utah juniper within GRSG habitat in GSENM".
Livestock Grazing	7b-6	Monitoring in the EA fails to include Monument values, resources, and purposes, instead focusing on livestock forage production . BLM plans to return livestock to treatment areas after 2 years. This indicates that BLM will ignore Project objectives.	Impacts to monument objects have been fully analyzed within the EA. The EA identifies measurable objectives for treatment success and implicitly states that the treated areas will be monitored annually for five years and every five years thereafter. Because this is a vegetation treatment, vegetation response is the primary monitoring metric, not livestock forage as suggested. Treated areas will be rested from grazing for a *minimum* of two years *or until objectives are met,* which is stated within the EA on more than one occasion.
Livestock Grazing	2-7	The EA fails to provide a scientifically reliable analysis of the anticipated impacts of continuing the current grazing regime or the likelihood of accomplishing Project goals.	Unregulated grazing is identified within the EA as one of the mechanisms that helped cause the current situation we see today. However, impacts to other resources from grazing after treatments are conducted are not within the scope of this EA and would be handled under a grazing permit renewal EA. The likelihood of achieving Project goals is discussed in chapter 4 of the EA for each resource carried forward.
Livestock Grazing - Rest After Treatment	9a-27	No treatment will be successful without proper livestock management. BLM staff has admitted they have difficulty keeping cattle off seeding areas.	Prior to any area being treated, an agreement between the BLM and the authorized permit holder would be signed which would prohibit grazing within the treated area for a minimum of two years or until objectives are met. If there are unauthorized trespass cattle in the treated areas during this period of time, the BLM grazing regulations provide a mechanism for action which include trespass fines and impoundment of livestock.

Livestock Grazing-End/ Reduce	6-1	Had cattle not grazed in these areas that are slated for various treatments in the first place, the mix of native grasses and forbs would dominate this landscape today. BLM's preferred alternative ignores of the consequences of previous policy decisions. Why would BLM reintroduce native grasses, only to allow cattle to ravage the range again, in two growing seasons?	This is an opinion. Habitat degradation takes place over many years and has many causes. To the extent possible the EA informed the reader as to how the habitat came to be what is today. This may include historic levels of grazing which may have exacerbated the problem. However, the EA also discussed other causes such as lack of ecological disturbance, climatic factors, and fire suppression. Simply removing livestock will not meet the purpose and need for the Project and is not something this EA addressed. Livestock decisions are made outside the scope of this EA. Cattle removal for two years is the minimum off-period but could go much longer if treatment objectives are not met.
Livestock Grazing-End/ Reduce	4-6	Numerous commenters suggest that removing, reducing or modifying livestock grazing might be a better solution to the overall purpose and need "to improve sagebrush-steppe habitat." Implementing the Project without also addressing the ecological impacts of grazing fails to meet the purpose and need.	Reducing, modifying or eliminating grazing is beyond the scope of this EA and is subject to its own environmental analysis through land use planning or grazing permit renewals. Furthermore, this action alone fails to meet the purpose and need. Simply removing livestock would fail to convert encroached sagebrush steppe into a healthy, resilient landscape. As outlined in the EA, areas such as the Project area that are in FRCC 3 or "significantly" altered from normal are in need of extensive mechanical treatment to restore to a natural or healthy state.
Livestock Grazing-Rest After Treatment	9a-29	There must be a zero tolerance policy for livestock trespass on treatment areas.	Prior to any area being treated, an agreement between the BLM and the authorized permit holder would be signed which would prohibit grazing within the treated area for a minimum of two years or until objectives are met. If there are unauthorized trespass cattle in the treated areas during this period of time, the BLM grazing regulations provide a mechanism for action which include trespass fines and impoundment of livestock.
Methods – Mechanical	10-5	The 2000 GSENM management plan states that chaining will not be used to remove juniper. But the EA mentions "chained" Project areas (EA, p.45).	Page 4 explicitly states that chaining would not be used to remove pinyon and juniper. However, the chain is an approved management tool in other vegetation types and as such is analyzed as an appropriate method in those vegetation types. Chaining, if used at all, would be limited to areas that have been treated in the past or areas devoid of pinyon and juniper trees.
Methods – Mechanical	4-11, 10-6	Mechanical treatments destroy biotic crusts, leading to erosion and spread of invasive weeds. Demonstrate in the EA that the ecological costs of doing the Project do not outweigh the benefits.	Chapter 3 of the EA describes the current condition of all affected resources, including biotic crusts. It also discloses and discusses the environmental consequences expected to other resources due from the Project. The costs of doing nothing as prescribed in the No Action Alternative and are also discussed for each resource within this chapter. BLM has demonstrated that the No Action Alternative has consequences of its own and that for many resources the consequences outweigh consequences due to the Proposed Action.
Methods – Mechanical	4-1	The EA states that herbicides, mechanical treatments, and prescribed fire may be used, but no specifics on their use or effects are provided. More detail is necessary before reaching a FONSI.	The EA analyzed the use of all available resource management tools on the entire area unless specifically stated. For example, on page 4 it states that chaining would not be used to remove pinyon and juniper, which makes up more than 75% of proposed treatment areas. Therefore, an area slated for pinyon-juniper removal could use all available tools ranging from a chainsaw to a masticator. Where this is a phased Project occurring for at least 15 years, specifically stating exactly what treatment method would occur on each individual area does not provide the BLM the flexibility it needs to adapt to changing resource conditions or apply adaptive management if one treatment method is found to be superior to another. A FONSI could still be reached because all available tools were analyzed and the impacts disclosed, none of which were found to be significant.
Methods – Mechanical	3-1	GSENM was designed to ensure its remote, undeveloped, and rugged nature remains for generations and for the protection of irreplaceable, scientific and cultural resources. It should never	How to ensure these characteristics described persist into the future is not agreed upon. One could argue that conducting treatments is what ensures these characteristics remain for generations. The sagebrush steppe, for example, is in danger of being lost within this area. It also merits consideration. The current monument management plan, while recognizing these characteristics, also allows for active land management as evidenced by the plan decisions regarding this type of work and laying out which tools are

		be subject to aggressive and invasive vegetation removal.	appropriate. BLM has not in any way violated the original proclamation or the land use plan. Impacts to other resources were analyzed within the EA.
Methods – Mechanical	1-1	Chaining on soils and topography could negatively impact populations of rare, threatened, and endangered plants.	Chaining would potentially occur on only about 1/4 of the Project area as described in treatment type 3 in areas that have already been treated. There are no threatened or endangered plants within the Project area. As stated in the EA, surveys for sensitive plants would be conducted prior to each annual phase and sensitive areas would be avoided unless data suggests that treatment could actually benefit these species. This has all been analyzed within the EA.
Methods-Hand thinning	9a-12	The EA says that hand thinning would impact sage grouse habitat and would be unsightly, but there is debris left behind by other methods proposed for use, such as chaining and mastication.	While the wording in the EA does not match the comment, it does state that it could potentially affect visual resources if conducted in areas with high tree densities. It also states that it could limit wildlife movement and provide perches for predatory birds. As stated in the EA, hand thinning is a viable tool but will be used selectively where deemed appropriate. It is not appropriate for areas dominated by phase II and III pinyon-juniper encroachment. Chaining, if used at all, would be limited to previously treated areas dominated by shrubs and grasses which would produce very little above ground biomass after treatment. Mastication would leave no more than a few inches of mulch which would be incorporated into the soil in a short 3-5 year time frame.
Monitoring	1-2, 2-4, 9a-30	BLM has not made a comprehensive, biological survey of flora and fauna in the Project area, nor does it provide a survey of listed or potentially listed species, which violates the Endangered Species Act.	Surveys for these species are not required or merited where no habitat for them exists. There is no Fish and Wildlife Service designated critical habitat within the Project area for any threatened or endangered species. Impacts to threatened and endangered species were addressed within the ID team checklist in Appendix C. As stated within the checklist, there are no individuals, populations, or habitat for any threatened or endangered species within the Project area.
Monitoring	9a-36	The BLM should enumerate specific, measurable goals and objectives for the treatment, such as percentages for desired species and functional groups, including biocrust and maximum percentages of exotic species, and bare ground.	Desired goals and outcomes for the Project were discussed in the desired future condition sections for each treatment type in chapter 2 of the EA. Specific, measurable Project objectives are listed within the Proposed Action in chapter 2 within the EA. A monitoring plan has been developed and included in Appendix D to discuss methodology. Annual monitoring of treated sites will determine site characteristics post treatment such as bare ground, exotic species cover, native species cover and biological soil crust cover.
NEPA-Alternatives	4-2, 10-3	The Purpose and Need called for improving habitat, and NEPA requires you to consider all reasonable alternatives that will accomplish this. Instead, you dismiss all other alternatives simply by citing the flawed Purpose and Need. The treatments proposed are not shown to be the only or the best way to reach the stated goals.	Improving habitat was just one of several reasons stated for the purpose of the Project. The BLM developed a Proposed Action that we felt best helped us to achieve that stated purpose of the Project and the associated objectives. When vegetation conditions become highly altered like those representative of the Project area and cross an ecological threshold (i.e. from a sagebrush dominated site to closed canopy pinyon-juniper), the available options for restoration truly do become more restrictive. The alternatives proposed were considered but found to not merit being analyzed in full detail as they truly would not meet the stated purpose and need of the Project. As the management options outlined in the Forest Service Rocky Mountain Research Station technical report entitled "Development of Coarse Scale Spatial Data for Wildland Fire and Fuel Management" (RMRS-87, 2004) state "these areas may need high levels of restoration treatments, such as hand or mechanical treatments, *before* fire can be used to restore the natural fire regime".
NEPA-Analysis	9a-1	The public should be shown an analysis of the risks of the Project and the hoped-for benefits. The risk of unintended consequences of mismanaged treatments is significant.	The EA is the risk analysis. The EA clearly states the problem, defines a desired future condition and then presents a solution (Proposed Action). The Proposed Action is then analyzed to disclose potential consequences, good and bad.

NEPA-Compliance	9a-13	By overhauling the purpose and need of the Project between scoping and the Draft EA, BLM has undermined meaningful public participation.	To the contrary, making changes to the Purpose and Need for a Project if necessary is exactly what scoping and public input is designed to do. Scoping is not required by NEPA but BLM felt it was important to allow public scoping on this Project in order to obtain the best product. Scoping comments from our cooperating agencies were fundamental in helping us come up with a purpose and need that truly reflected what was needed on the landscape at this time. Public participation was also granted during the draft EA review process, and these two opportunities were very meaningful in helping the BLM refine the purpose and need and also direct the document.
NEPA-Compliance	10-1	Given that the Project involves creating landscape-level environmental impacts of multiple types and intensities, it is not accurate to arrive at a FONSI.	As with all NEPA Projects, this Project was analyzed and reviewed by an interdisciplinary team of resource experts in their associated fields of knowledge. The Proposed Action and the associated environmental impacts were fully analyzed within the EA and found to not be significant. This is in line with myriad other vegetation related Projects proposed each year by BLM, which also conclude that there will be no significant impacts. The BLM maintains a list of Projects that automatically rise to the level of an EIS such as open-pit mining or a land-use plan. Vegetation treatments do not automatically rise to this level and significance is determined on a case by case basis through the NEPA analysis.
NEPA-Compliance	8a-1	It is astonishing that BLM has issued a FONSI for this Project. The justification for this finding is, in places, incoherent. The EA's justification for the Project is restoring sagebrush grassland habitat will have significant benefits, yet the FONSI states "the activities described in the Proposed Action do not include any significant beneficial or adverse effects."	It is incorrect to say that the EA states that there will be "significant" benefits. The EA simply discusses the impacts to each resource whether they be positive or negative but does not use the word "significant" as it has a specific definition within a NEPA document. Any Project, as well as this one, may have beneficial or adverse impacts as long as they are disclosed and are not found to be significant.
NEPA-Compliance	14-1	We request a 15-day public comment extension.	We feel the comment period was adequate. This Project has been under consideration with public involvement since November 2016. (A letter was written in response that stated that the BLM would not approve the extension)
NEPA-Cumulative Effects	9a-15, 9a-16	The EA must take a hard look at the cumulative effects of such a large amount of vegetation removal within GSENM and adjacent lands. BLM's inability to properly consider and analyze cumulative, connected, and indirect effects of this Project indicates that the BLM has improperly segmented the proposed Project to avoid any conclusion that the cumulative impacts are "significant."	Discussion of past and reasonably foreseeable future cumulative impacts is mandatory in every NEPA document. Cumulative impacts as well as any indirect impacts for each affected resource were addressed within the EA. As far as "connected" actions of this Project, there are none. This Project is independent of any other ongoing or proposed vegetation management Projects within Kanab Field Office or the Grand Staircase. BLM made changes to the final EA to better reflect the appropriate analysis area and scope of activities that would be analyzed for cumulative impacts. The vegetation section in particular was enhanced due to public comments and was improved upon for the final EA.
Roads	2-14	The EA fails to analyze the transportation development aspects of the Project, including roads that will need to be improved or created for the Project.	BLM has a current travel management plan that identifies roads which are open to any vehicle, ATVs, or for administrative purposes only. Nothing in this proposal alters the current travel management plan. All of the areas proposed for treatment are adjacent to existing roads. Equipment necessary to conduct the on-the-ground work will use these existing roads to access treatment locations. In the Recreation section of chapter 2, this is discussed.

Science	10-2	In the EA, several assertions about the need for the Project and proposed treatments are made without offering peer-reviewed research and/or clear and convincing explanations to support them.	The need for the Project was clearly defined within the EA and ties back directly to ecological site data and fire regime condition class, both of which are broadly accepted methods and form the basis for sound land management. Furthermore, these methods and their associated science is what our current management plans reference and tie back to. The Fire Management Plan, which in large part provides the purpose and need, uses these methodologies and this is our most current guidance.
Science	10-12	This Project should be used as a research study to assess the effectiveness of the treatments being recommended.	The effectiveness of the Project to achieve the goals and objectives is going to be monitored annually for the first five years after treatment and every five years thereafter. This data is crucial in determining treatment success. In addition, other types of monitoring and research are either already ongoing or would be initiated. Ongoing research will include treatment effects to reptiles and amphibians and effects to pollinators such as bees, moths and butterflies. Pre-treatment data has already been collected on numerous sites. These research Projects will have results published at a later date as treatments are initialized.
Science	9a-32	BLM is not upholding the National Conservation Lands management principles emphasizing science-based decision making. This was illustrated by the refusal of BLM to issue a special use research permit to Western Watersheds Project to gather data on the Monument.	The EA used science based information in every aspect from the planning phase, purpose and need, Proposed Action and the subsequent analysis. Ecological site descriptions and fire regime condition class are science based. BLM used a variety of methods to analyze the Project area, including on-site visits, science based literature, repeat photography, various land use GIS layers, including soils, topography and vegetation, range trend data and professional analysis by an interdisciplinary team. Anyone is welcome to submit a research proposal as did Western Watersheds on May 24, 2017. However, the proposal we received was flawed. During verbal and email communications, BLM and WWP worked together to draft a science-based proposal. BLM last communicated with WWP (Laura Welp) on August 15, 2018 wherein BLM requested a finalized proposal based on these conversations. BLM did not receive an amended proposal and therefore, no research permit and authorization letter was approved.
Seed-Native Only	7a-1, 7b-5, 9a-35, 10-8	There is no support in the MMP for non-native species used outside of emergency situations. Any use of non-native species for rangeland Projects would not help achieve a natural range of native plant associations. Seed mixes should use native species exclusively.	The MMP was adhered to fully as there is discretion on when a non-native mix can be used. Furthermore, the MMP has been amended through the 2015 sage-grouse EIS and while it calls for the use of natives primarily it does not state outright that non-natives may not be used. As stated in the EA, we do not plan on using non-native seed in any of the new treatment areas. However, the reality is that some of this area was treated in the past using a mix of native/non-native seed. It is nearly impossible to completely rid an area of non-native seed once it has been established. Therefore, the limited use of functionally equivalent non-native seed in areas that are currently dominated by non-native grasses essentially has no effect on that particular area.
Socio-economic	4-3	The EA states that adverse effects will be felt by wilderness therapy groups and hunting guides that use treatment areas. In the EIS, provide an economic analysis, which includes the costs to these businesses and demonstrate that the Project will not have adverse socioeconomic impacts.	The issuance of Special Recreation Permits (SRPs) such as those to wilderness therapy groups or hunting guides is a discretionary action. All affected SRP holders have been notified of the Project and have been allowed the opportunity to provide comments. We have received no comments from them suggesting an economic hardship. The EA notes that there could be "operational changes" in the way SRP holders conduct their day to day business but ultimately concludes that where this is a phased Project spanning 15 years and treating only small acreages per year, the impacts are not significant. The issue does not warrant further analysis.
Treatment Mainten-ance	2-12, 9a-39	BLM should include the costs that this Project is expected to incur.	The cost of conducting vegetation management activities varies by year, location, size of treatment, accessibility and other factors. The predicted costs of varying treatment types were added in Appendix I of this EA and can also be found at: www.sagestep.org/pdfs/CostOfTreatments.pdf Compared to the cost of large wildland fire suppression, vegetation treatments are more cost effective. A study from 2007 estimated that the average cost per acre for a major wildland fire was $979/acre (*Estimating Suppression Expenditures for Individual Large Wildland Fires*--Gebert et. al

			2007). Today's cost per acre is likely much hire as suppression costs in 2017 exceeded 3 billion.
Tree Encroach-ment	4-7	BLM blames erosion and gullying on pinyon-juniper expansion, but it could also be caused by livestock grazing. Provide empirical data showing that pinyon-juniper encroachment cause this erosion, and that removal will reduce erosion.	There is little doubt that pinyon and juniper encroached lands contain substantial bare ground and that erosion rates are very high in these areas as outlined in *Hydrologic and Erosion Responses of Sagebrush Steppe Following Juniper Encroachment, Wildfire, and Tree Cutting*--Pierson et. al 2013). According to the FRCC data, 93% of the Project area is "significantly" altered from normal and exists in phase II or III encroachment where substantial bare ground exists. Erosion is discussed within the EA and the EA recognizes the potential for increased erosion in the short-term. However, in the long-term, erosion is expected to decrease. A very recent study conducted by Williams "clearly demonstrates that tree debris following mechanical treatments can effectively limit microsite-scale runoff and erosion over time" (Williams, C.J., et al., *Vegetation, Hydrologic, and Erosion Responses of Sagebrush Steppe 9 Yr Following Mechanical Tree Removal,* Rangeland Ecology & Management (2018))
Tree Encroach-ment	4-8, 9a-10	The EA fails to present data supporting claims or data that pinyon-juniper has greatly expanded from historic ranges, or that fire frequency is outside historic norms.	Pinyon-juniper expansion into western sagebrush steppe habitat is well documented and recognized as outlined in chapter 1 of the EA referencing numerous peer-reviewed articles. Vegetation potential defined by ecological site descriptions was compared to the existing vegetation using remote sensing data and shows that pinyon-juniper cover is more than 200% over what is expected in the Project area under normal conditions. Fire frequency was obtained from a broadly recognized and widely used methodology (fire regime condition class). This data suggest that 93% of the Project area is "significantly" altered from normal conditions. The EA states that only 1% of the Project area has seen fire in the past 34 years.
Vegetation-Impacts	1-3	During post Project treatment, the variety of supported plant and wildlife species will be changed by reduced soil conditions, which will result in reducing diversity towards a monoculture.	To the contrary, the highest species diversity (plant and animal) is found in mid-seral vegetation conditions. A monoculture is what we see on the ground today with domination by pinyon and juniper with no diversity of understory and few wildlife species utilizing the area aside from just passing through. As noted in the measurable treatment objectives for the Project, the Proposed Action seeks to increase native species plant diversity by 25% within five years. Diversity of wildlife is also expected as more micro habitats are created through mosaic treatment patterns. Current studies adjacent to the Project area already show that reptile diversity is four times greater in treated sites versus untreated sites.
Visual Resources	9a-33, 10-9	BLM must not allow any changes that would degrade the existing VRM class, for which almost 89% of the Project area is VRM Class II.	As stated within the EA regarding objectives within VRM class II, management actions may be seen but should not attract the attention of the casual observer and should retain form, line, color and texture found in the predominant natural landscape (chapter 3). Design features were incorporated within the EA to achieve these VRM objectives within the Proposed Action in chapter 2.
Visual Resources	7b-3	The EA fails to provide a VRM analysis of the Proposed Actions (EA, p.9).	To the contrary, VRM analysis is provided in chapter 3 of the EA. The analysis fully recognizes that there is potential in the short-term for impact without proper planning in layout and implementation. The proposed treatments would be designed to mimic natural appearing edges between vegetation types and to resemble natural openings and clearings in the vegetation patterns, such that contrasts in form, line, color and texture would be minimized in an attempt to meet VRM objectives. In the long-term, evidence of vegetation treatment would diminish considerably and would serve to make the visual landscape more interesting.
Water Develop-ment	11-1	As our climate dries, water catchments or guzzlers may be necessary in the Project area.	There is currently a proposal to construct a water catchment on First Point which lies within the Project area but it is not connected in any way to this EA and will be analyzed under a separate EA if carried forward. Any future water developments within the Project area would be analyzed under their own NEPA document.

Wildlife	2-9	The EA fails to analyze in detail to what extent improvements to forage will be available to wildlife, as opposed to cattle grazing.	Wildlife species inhabiting the area are free-roaming and therefore would have full access to the treated areas. Cattle use will be completely removed for a minimum of two years to allow vegetation to fully establish. When cattle use resumes, cattle are allotted a season of use and generally are rotated through various pastures to ensure impacts to any one area are minimal. Wildlife species would have full access to the treated areas and be able to find their life-cycle requirements within them.
Wildlife	2-11, 10-4	The EA fails to analyze in detail the foreseeable impacts of the Project on threatened and endangered species.	Refer to record #s 47 and 49 and associated responses. There are no threatened or endangered species or critical habitats within the Project area.
Wildlife	1-5	The Project risks increasing ephemeral and perennial stream sedimentation as a result of treatment, which will impact avian, riparian and aquatic species.	Short term potential for increased sedimentation is noted within the EA. Long-term, the Project is expected to reduce sedimentation, also noted in the EA. Addition of gully plugs to capture sediment before it reaches perennial systems would positively impact the Project area and begin rebuilding the water table.
Wildlife Benefit	9a-18	The EA states that greater sage-grouse appear to use treated areas to a greater extent than untreated areas. However, this mischaracterizes the reported data.	The referenced study referred specifically to female grouse. The EA has been updated to reflect the full array of the research going on within the Project area and the current results. Grouse clearly use treated areas. The population of grouse within the Project area is extremely low and so is the sample-size, making it difficult to fully understand the interactions of grouse and the current landscape. Anecdotally, within the proposed treatment area, sage-grouse are observed exclusively within treated areas where sagebrush dominates the landscape instead of pinyon and juniper.
Wildlife Benefit	9a-17	The EA states that the treatments are expected to positively impact wildlife, but the EA does not establish how removal of pinyon and juniper will accomplish this goal.	The EA in chapter 3 analyzes the impacts from the Proposed Action on wildlife species. The EA does not seek to paint an unrealistic picture of those impacts. As the EA states, pinyon and juniper wildlife species, especially birds, would see a reduction in habitat and could see declines. However, the purpose for the Project is to enhance the sagebrush steppe habitat which is severely diminished within the Project area. As sagebrush steppe habitat improves over time through Project activities, it is expected that sagebrush steppe dependent species would see a benefit. This is logically explained within the EA.

APPENDIX G

KEY TO COMMENTERS

Skutumpah Terrace Sagebrush Steppe Enhancement EA (DOI-BLM-UT-0300-2017-0003-EA)

Commenter #1
Marv Poulson

Commenter #2
Scott Berry, Grand Staircase Escalante Partners (GSEP)

Commenter #3
Chris Lish

Commenter #4
Jeff Lonn

Commenter #5
David and Jennifer Curtis

Commenter #6
Alex Steckel

Commenter #7
Jonathan Ratner, Western Watersheds Project

Commenter #8
Scott Lehmann

Commenter #9
Kya Marienfield, Southern Utah Wilderness Alliance

Commenter #10
Carol Blaney

Commenter #11
Norman McKee

Commenter #12
Bruce Bunting

Commenter #13
Dan Barton

Commenter #14
Kya Marienfeld, Southern Utah Wilderness Alliance

APPENDIX H

REPEAT PHOTOGRAPHY

Repeat photos near the Skutumpah Terrace Sagebrush Steppe Enhancement Project.
These areas share many site characteristics with the Skutumpah Terrace Project (Elevation, Climate, Soil-type, Ecological site potential, Departure from expected vegetation).

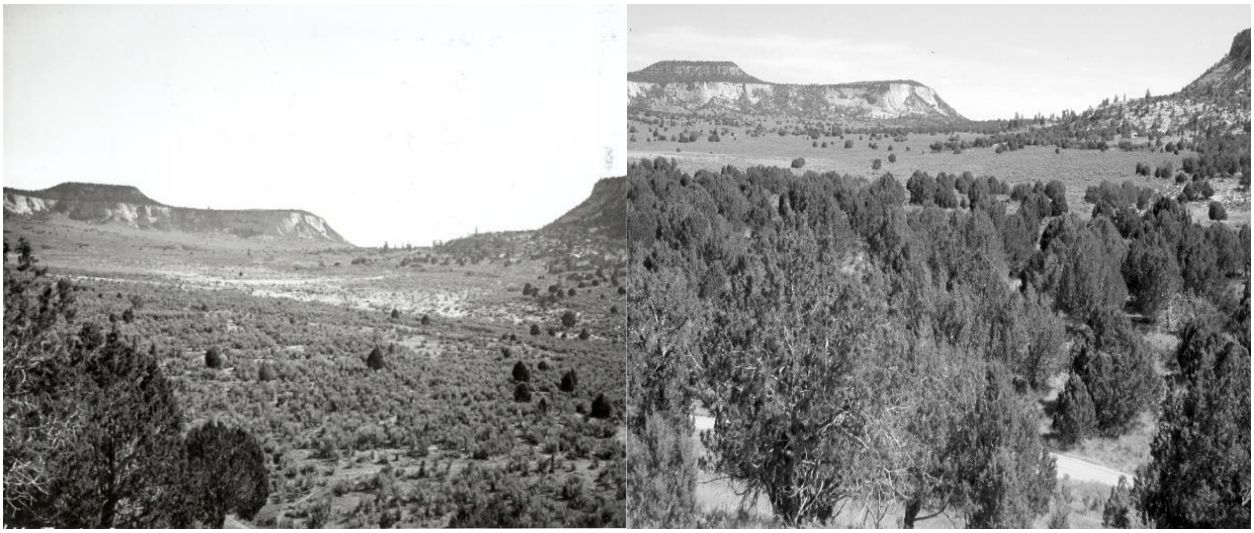


Plate 1189X. Elephant Gap 1936 – 2006 Viewed south-southeast to Elephant Gap. Pinyon and juniper now block the original camera station, so the retake was made from the nearest open area. Pinyon and juniper have increased, while sagebrush has declined. Original photograph taken by J.C. Anderson (No. 6) in 1936; retake by Charles E. Kay on June 4, 2006 - - Photo No. 5630-28A. Section 1, Range 8 West, Township 43 South; UTM 339750 E, 4107450 N; elevation 5,920 ft. Original photograph held by the U.S. Geological Survey Photographic Library, Denver, CO.

Plate 1190X. Harris Point 1936 – 2006 Viewed north across Harris Flat to Harris Point (6,666 ft). Pinyon and juniper now block the original camera station, so the retake was made from the nearest open area. Pinyon and juniper have increased, while sagebrush has declined. Original photograph taken by J.C. Anderson (No. 5) in 1936; retake by Charles E. Kay on June 4, 2006 - - Photo No. 5633-6. Section 1, Range 8 West, Township 43 South; UTM 339750 E, 4107450 N; elevation 5,920 ft. Original photograph held by the U.S. Geological Survey Photographic Library, Denver, CO.

APPENDIX I

COST OF TREATMENTS

Guide to Vegetation Treatment Costs for Land Management in the Great Basin Region

Sagebrush Steppe SageSTEP Treatment Evaluation Project

Treatment Type	Some Factors Affecting Cost	Example Costs*	Advantages of Treatment	Disadvantages of Treatment
Prescribed Burn Pinyon-Juniper Ecosystems and Sagebrush Ecosystems	**Vegetation Type:** Low Cost: Grass (Fuel Model 1–3); Medium Cost: Shrub (Fuel Model 4-7); High Cost: Forest (Fuel Model 8-11) **Size of Treatment Area:** Per acre costs decrease as treatment area increases. **Operational Difficulty:** Burn units on steep slopes, with mid-slope control lines, or adjacent to homes will have higher costs.	**Low Cost:** $5–$25 per acre **High Cost:** $125–$175 per acre	- Low per acre cost when treating large areas - Mimics natural processes which leads to positive public perception - Can effectively reduce fuel load and intensity of future fires - In areas with an abundance of native plants a prescribed burn performed in favorable weather conditions can favor the return of native species	- Intensive planning requirements and liability concerns - Requires qualified applicators - Impaired air quality and reduced aesthetics over short term - Imprecise and variable treatment as fires may burn hotter or cooler than planned - Need for adequate fire weather conditions, narrow time period for application - In certain plant communities can favor return of non-native plants such as cheatgrass
Chainsaw Cut Pinyon-Juniper Ecosystems	**Tree Density:** Cost increases with density of trees to be cut. **Terrain:** Steep terrain and distance from roads or difficult accessibility increase cost. **Post-Cut Treatment:** If trees are valued as a product (e.g., firewood) they may be removed for free or reduced price. If trees are to be stacked, chipped, burned or scattered, cost increases with labor intensity.	**Low Cost:** $10–$40 per acre **High Cost:** $200–$600 per acre	- Precise treatment, ability to target trees and control boundaries - Ability to treat areas too steep for heavy machinery - Promotes growth of understory vegetation by minimizing disturbance and removing competition - Cut trees, slash or chips can be left on site to control erosion	- Can be prohibitively expensive in rough, inaccessible terrain with high tree density - Fuel loads can be increased by leaving cut trees on site - High density of cut trees left on site can limit mobility of large herbivores and kill desirable plant species by shading - Understory response can be unpredictable and slow, especially in areas of high tree density - Small trees may be overlooked, sometimes requiring follow-up treatment
Heavy Machinery Pinyon-Juniper Ecosystems (Mastication, Chaining, Feller-buncher) Sagebrush Ecosystems (Mowing, Disking, Harrowing)	**Terrain:** Steep slopes and rough terrain increase cost and can even prohibit use of heavy machinery. **Vegetation Type and Density:** Mature, dense stands of trees are the most costly to treat and costs increase where multiple passes are required. **Fuel Prices:** High fuel prices as well as remoteness of treatment site increase cost.	**Sagebrush Treatment:** $10–$65 per acre **Pinyon-Juniper Treatment:** $50–$500 per acre	- Can be very effective in reducing fuel loads and thinning sagebrush, pinyon and juniper - Ability to target specific trees (mastication, feller-buncher), vary treatment intensity and precisely control treatment boundaries - Can be applied in combination with prescribed burn to increase benefit/ decrease cost - Flexibility in timing of treatment	- Access to roads and fuel supply required - Should avoid use when soils are excessively wet - Can require follow-up treatment for small trees - Costly in cases of high tree density and rough terrain - Heavy machinery cannot be used in excessively steep, rough or inaccessible terrain
Herbicide Application Sagebrush Ecosystems	**Cost of herbicide and rate of application:** Herbicides can be applied at different rates according to vegetation characteristics and management goals. **Application method:** Application by hand in rugged terrain is most costly, while aerial and ground rig application cost significantly less.	**Low Cost:** $8–$20 per acre **High Cost:** $50–$250 per acre	- Can effectively target specific plants over large area - Often most cost effective method to remove undesirable plant species or groups - Viable option in remote, steep or rugged terrain when applied aerially	- Negative public perception and concerns regarding broader environmental impact - Can increase fuel flammability in the short-term - Potential for targeted species to develop immunity if overused

*High and low costs represent those commonly reported by SageSTEP collaborators and the NRCS in 2010 and 2011. Costs reported here are meant to provide a starting point only and should be verified through additional research. Many of these treatments are eligible for cost-share assistance through the NRCS Environmental Quality Incentives Program. Contact your local NRCS agency or visit http://www.nrcs.usda.gov/programs/eqip/ for more information.

Updated May 2011